

Volume 19, No. 9

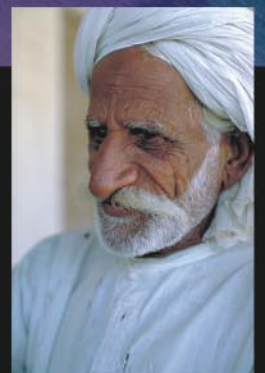
September 2000

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Monitoring Times

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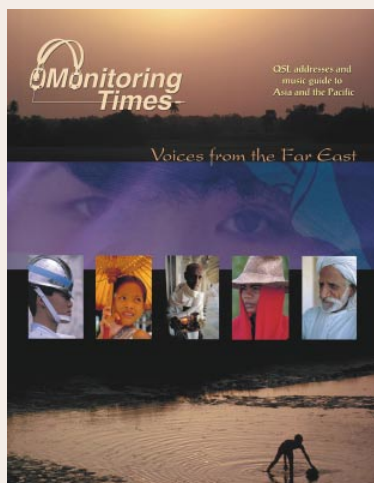
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Cover Story

Far Eastern Rendezvous

By Bob Padula

Recently returned from a trip to Malaysia, Vietnam, and Singapore, the author has compiled a fresh, on-the-ground look at what's on the air, especially on shortwave, from these locations. Technology is in transition there as it is everywhere, and Padula found the use of medium and short waves to be greatly reduced for domestic broadcasting.

Winter months pose the best opportunity for DXers to tune in these elusive targets. This summary of who's on the air, approximately when and on what frequencies, and type of programming, will give you a head start on receiving and verifying signals from this exotic region of the world.

Cover design by Bill Grove. Story begins on page 10.

C O N T E N T S

Guide to QSL Addresses: Asia and Pacific..... 14

By Gayle Van Horn

For years, Gayle Van Horn has been accumulating station addresses for the purpose of sending in signal reports for verification – the radio hobby niche known as “QSLing.” Following a brief introduction, this comprehensive guide to station addresses in Asia and the Pacific will become a valuable reference source, especially when compiled with other regions in future installments.

Regional Music from Asia and the Pacific..... 18

By Bob Tarte

Back by popular request, Bob Tarte presents a second article on using music to identify shortwave stations. This time he looks at music from Asia and the Pacific, with recommended recordings and sources to hear examples of the region's distinctive instruments and styles.

DX Lifesaver: the MiniDisc Recorder 22

By Bob Tarte

The CDs in the preceding article give you the opportunity to listen to a style of music over and over until it becomes identifiable. But that snippet of a station ID in a foreign language or Morse code is gone – no playback or second chance – unless you recorded it. But, take a tip from Tarte: Forget those analog tape recorders and get yourself a digital MiniDisc recorder!

Bluetooth: the New World of Wireless 26

By Jesse Finkelstein

The day when many of the appliances and gadgets in your house are tied together into a “piconet” may not be that far removed. Even though it's nothing you'd want to listen to, the wireless world of the future is built on radio.

Those Ham Radio Special Event Stations 28

By Douglas Blakeslee

Special Event stations can commemorate or publicize almost anything (How about “Toad Suck Days”?!). You usually don't have to be a ham to participate, and they're a great way to collect some memorable “wallpaper.”





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Address: P.O. Box 98,
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Telephone: (828) 837-9200
Fax: (828) 837-2216 (24
hours)
Internet Address: www.grove-ent.com or
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Owners

Bob and Judy Grove
judy@grove-ent.com

Publisher

Bob Grove, W8JHD
bgrove@grove-ent.com

Managing Editor

Rachel Baughn, KE4OPD
mteditor@grove-ent.com

Assistant Editor

Larry Van Horn, N5FPW

Art Director
Bill Grove

Advertising Svcs.

Beth Leinbach
(828) 389-4007
beth@grove-ent.com

Reviews:

Wondering if the new mobile trunk-
tracking Radio Shack PRO-2067 scanner is
for you? Parnass helps make the choices
more clear-cut in his review on p.100. To
help shortwave listeners better understand
receiver specifications, our reviewer ex-
plains what synchronous detection is and
how it works; is it worth paying a little more



to get it? (p. 98)

Want a radio to meet all emergencies?

Then you'll need more than just a weather
radio. The tiny Sangean DT-300VW cov-
ers all local bands (p.96).

Free at last! PC-controlled radios are be-
ginning to break the ball and chain of the
computer connection. Catalano looks at
three different computerless approaches
(p.94).

If you are running multiple receivers off
the same antenna (as at a DXpedition) you
wouldn't go wrong with the antenna split-
ter from Wellbrook Communications, says
Jacques d'Avignon. Also, Bob Grove tests
the Austin Condor rubber duckie antenna
side by side with a new competitor, the Dia-
mond RH77CA; was there any difference?
(p. 104)

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Low Power FM Update

On July 3rd, the House passed a spending bill that would reduce the FCC's budget by some \$2 billion. The Republican-led Congress wants to limit the FCC's ability to tamper with telecommunications policy. Salaries and expenses in the FCC's Legislative Affairs Office were particularly hard hit. On July 5th, the House passed still more anti-FCC legislation.

The strain on the Commission (appointed by the Democratic administration) from Congress is not new. Responding to opposition and pressure from the National Association of Broadcasters, Congress is particularly infuriated by the FCC's intent to create up to 1,000 low power community FM stations. Congress response is to reduce their funding. But the FCC is plowing ahead anyway with its plan.

"In creating a low power FM radio service, the FCC has thrown open the doors of opportunity to the smaller, community-oriented broadcaster, and will give hundreds – if not thousands – of new voices access to the nation's airwaves."
...FCC Chairman William E. Kennard.

On January 20, 2000, the FCC adopted rules creating a new, noncommercial low power FM radio (LPFM) service. The new broadcast service will consist of stations with maximum power levels of 10 watts (LP-10) – reaching an area with a radius of between 1 and 2 miles, and 100 watts (LP-100) – reaching an area with a radius of approximately 3-1/2 miles. The 100-watt stations will be authorized first.

Once applicants from all states have had the opportunity to apply for 100 watt LPFM licenses, the FCC will open filing windows for 10 watt stations. The FCC decided against licensing 1000 watt (LP-1000) LPFM stations.

Low power FM radio was first requested in petitions filed by two Extra Class ham operators, Nickolaus Leggett N3NL of Reston, Virginia, and Rodger Skinner W4FM of Pompano Beach, Florida. Currently, the smallest class of commercial FM radio stations run 6000 watts. The new LPFM stations would operate throughout the FM broadcast band. The stations will be geographically separated from existing stations on the same (co-channel) channel, the next (first adjacent channel) channel, and the channel two channels away (second adjacent channel). The new stations will not, however, be geographically spaced from stations three channels away (third adjacent channel).

The new LPFM service will be exclusively non-commercial. Only government or non-profit organizations are eligible to apply for an LPFM license and applicants must be based in the community in which they intend to broadcast. In addition, current broadcast licensees or parties with interests in other media – cable or newspapers – will not be eligible for LPFM stations. LPFM stations will be licensed exclusively to local entities for the first two years of license availability. Individuals are also not eligible to apply for LPFM stations.

LPFM licenses will be awarded for eight year, renewable license terms. A point system is being used to rank applicants that request the same frequency in the same community. Points are awarded for (1) showing two years prior community presence, (2) pledging to operate at least 12 hours daily, and for (3) locally originating at least eight hours of programming daily.

Previously unlicensed (pirate) broadcasters will be disqualified from holding LPFM station licenses unless they certify that they ceased operations when notified of their violation of FCC rules or by February 26, 1999. Unauthorized FM stations that continued illegal broadcasting are ineligible for any broadcast license. Eligible licensees will be subject to the same character qualifications as currently applied to full power licensees.

NAB's campaign of "disinformation"

Fearing competition, the National Association of Broadcasters has been fiercely opposing the establishment of LPFM. NAB has been distributing a compact disc to members of Congress that supposedly demonstrates excessive interference to existing commercial FM radio stations. The FCC's Office of Engineering and Technology called the CD demonstration "...misleading disinformation" and "...simply wrong."

The Commission said, "The NAB CD was produced by artificially mixing two previously recorded radio signals and is not a demonstration of actual interference between two FM radio stations. ...The NAB 'crosstalk' demonstration simply does not represent actual FM radio performance and therefore is meaningless." The

Commission added that the CD "...can only be viewed as a deliberate misrepresentation of the FCC's findings and analysis."

"We believe the Commission took a thorough and indeed conservative approach in designing a low power FM radio service that protects the integrity of the broadcast radio spectrum," FCC said.

LPFM applications are pouring in...

The filing of applications is being handled in five phases. The FCC has already received 750 Low Power radio Form 318 applications in the first filing window which ended June 8th. The FCC Form 318 application has been added to the FCC's Forms page located at www.fcc.gov/formpage.html. LPFM applicants

may only submit one application for a single frequency.

A seven page (Acrobat reader) Applicant's Guide to LPFM is posted at www.fcc.gov/mmb/prd/lpfm/

[lpfmguide.pdf](#). Among those applying were hundreds of state and local governments as well as community based organizations ...especially churches and schools.

So far, ten states plus two territories (selected by lottery) have been authorized to submit applications. In Group 1 were: Alaska (27 applications have been submitted so far), California (309), District of Columbia (4), Georgia (109), Indiana (73), Louisiana (66), Maine (12), Mariana Islands, Maryland (17), Oklahoma (61), Rhode Island (25) and Utah (19). The second filing period (Group 2, Aug. 2000) will take applications from Connecticut, Illinois, Kansas, Michigan, Minnesota, Mississippi, Nevada, New Hampshire, Puerto Rico, Virginia, and Wyoming. Group 3 (Nov. 2000) includes: American Samoa, Colorado, Delaware, Hawaii, Idaho, Missouri, New York, Ohio, South Carolina, South Dakota and Wisconsin. Group 4 (Feb. 2001): Arizona, Florida, Iowa, New Jersey, North Dakota, Oregon, Tennessee, Texas, U.S. Virgin Islands, Vermont and West Virginia. Group 5 (May 2001): Alabama, Arkansas, Guam, Kentucky, Massachusetts, Montana, Nebraska, New Mexico, North Carolina, Pennsylvania and Washington.

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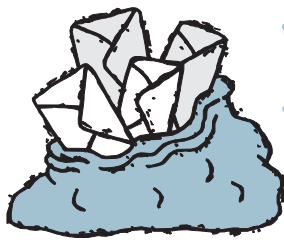
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LETTERS TO THE EDITOR

Testing, testing...

Those of you who have a subscription to *Monitoring Times* and receive it through second class mail will have noted that it came in a plastic bag this month. Though this may be cause for great rejoicing for some of you, don't get used to it just yet! For the moment, this mode of delivery is just an experiment.

Ever since last spring, there has been a rather dramatic increase in the number of damaged and missing magazines. Unfortunately, the problem is apparently not temporary, since it has continued over the summer editions. So, for the next two or three months, we will experiment with polybagging to see whether that provides a solution. As soon as we see enough results to evaluate, we'll decide whether we can afford to continue the practice. We would have to replace hundreds of damaged magazines to equal the expense of bagging the entire shipment, but our bottom line is subscriber satisfaction.

If delivery has been a problem at your location, you have a stake in this experiment: Be sure to let us know in what condition your magazine arrives (or if it doesn't). We will cheerfully replace your magazine if it does not arrive in your mailbox by the 5th of the month. Just call 800-438-8155 for your replacement.

More Staff Changes

Last month Jim Frimmel announced in his Selected Programming column that he would be retiring as Program Manager for *Monitoring Times*. I was remiss in not acknowledging his retirement in the same issue. Jim has been a tremendously hard worker for *MT* since June 1989; on his own time he has prepared dozens of schedules and logs for the readers to download free of charge off the *MT* website. Thank you, Jim, for performing this labor of love and for being such a supportive friend and hobbyist. Jim and his wife are looking forward to doing more traveling – a definite conflict with deadlines!

Moving quite naturally into the position of program manager is John Figliozzi – editor of the "Programming Spotlight" column and author of the *Worldwide Shortwave Listening Guide*. Accurate programming schedules are probably even more impossible to maintain than frequency schedules, since stations are less forthcoming on programs and content. Often they do little advance program planning, at least not in time

for our deadlines. John will be most grateful for your support in the form of reports, additions and corrections to programming schedules.

We have also given two veteran staff members a breath of fresh air with some reassignments. Skip Arey jumped at the chance to edit the "On the Ham Bands" column following Ike Kerschner's retirement. (I know – a lot of you thought he was already the ham columnist!) Well, he'll continue to lead ham newbies through the ropes as well as introducing projects and topics for more experienced amateurs.

Ken Reitz – who has already demonstrated his broad interests in feature articles and reviews – will be taking over the "Beginners Corner." I have failed to find any field Ken can't get excited about, so look for this column to span the basics of radio, dc to daylight.

Hobbyists in the Media Spotlight

Interestingly, there has been a flurry of media interest in some obscure aspects of utility listening which has resulted in interviews with several *MT* staff and contributors. David Goren, Hugh Stegman, and others contributed to a segment on shortwave numbers stations for National Public Radio's "Lost and Found Sound" series aired on "All Things Considered" in May. Similarly, "USA Today" ran a story to which Hugh and others also contributed on how people are using the Internet to compare information on numbers stations. Hugh says, "Shortwave in general is on something of a roll. People are so amazed that it still exists, that they get interested in knowing more."

Radio/TV Compatibility

"In the article on Jasper's Antique Radio Museum in the June issue, it states that a General Radio and Television Corporation AM radio is not compatible with television despite claims to the contrary by the manufacturer. It is true that this radio would not function with modern electronic television. However, such regular radios were used as receivers for mechanical television systems in the Twenties and Thirties.

"I find the round design curious. Since the mechanical televisions used a scanning disk it is possible that the GRTC receiver was given a round design to match the appearance of these early televisions. There are several informative web sites with information

Radio Honor Roll

A Good Samaritan Scanner Story

Chris Arndt

In the June 2000 issue of *MT Letters*, John Henderson asked for more good deeds done by scanner listeners. Maybe my story will be of interest to you (and John).

In late December 1979, I was returning to California from a Christmas visit back home in Illinois. I had prepared for the trip by purchasing copies of *Police Call* for every state I would be traveling through, so I could program my Bearcat 250 appropriately as I traveled.

Shortly after I dropped into Texas from Oklahoma on I-35, I heard a transmission on a Texas Highway Patrol frequency regarding a "be on the lookout" describing a particular motorhome including the distinctive spare tire cover and Michigan license plates, enroute from Michigan to the west. One of the occupants, a man, was to be told to report to the nearest hospital and contact his physician back in Michigan, as his heart pacemaker had been recalled!

Several hours later, after I made the turn west onto I-70, I came up behind a motorhome matching the description, even to the Michigan plate and tire cover. I was trying to make time, and they were toodling along at less than 50 miles per hour. They obviously hadn't gotten the message yet.

I fell in behind them and considered my options. I was 24, and driving a white over powder blue decommissioned 1969 Superior Pontiac Bonneville ambulance with California plates (the old kind, that looked like a big station wagon). It wasn't likely that they were going to pull over for the likes of me!

I followed them for two or three hours, hoping they would pull off. Finally, I ran low on gas and I had to pull off. The first thing I did was to find a phone and call the Highway Patrol. I think the dispatcher thought I was loony until I asked him to check that day's bulletins on the teleprinter and he saw the item. I told him my location, and their direction and rate of travel. He thanked me and I gassed up.

By the time I got back on the road the scanner was really buzzing. I think the Patrol was pulling over every motorhome remotely fitting the description. Finally, after 5 or 10 minutes, an officer came on the air and announced that the party had been stopped and notified, and was on the way under escort to the nearest hospital.

I never heard anything more after that, but it pleases me to finally be able to share my story.

on this fascinating corner of broadcasting history."

www.dfm.dircon.co.uk/tvhist1.htm
pyanczer.home.mindspring.com/Tour/
www.mztv.com/mech1.html

— Bryan Turner W8LN, Athens, Alabama

Radio Privacy versus Radio Rights

David T. Stark, frequent *MT* contributor, scanner hobbyist, Amateur Extra Class, and student pursuing a doctoral degree in Criminal Justice, sent in the following thoughts and opportunity for further discussion:

"I noticed some synergy in the May issue of *MT* among several different articles and columns that addressed the issue of radio privacy. Around that time, I was planning an online project about the same topic. The Rapid Media Project is available for viewing and participation now.

"The purpose of the Project is to get some discussion and cooperation going with regard to rapid dissemination of information about in-progress incidents that could affect the safety of the general public. Traditional news media are not consistent in getting the word out fast enough. Sometimes even 24-hour news outlets only begin reporting events after they have ended.

"Legality is a major consideration. How do news services justify reacting to informa-

tion that they intercepted with a scanner? Aren't they violating the Communications Act? Does the First Amendment truly shield them from liability? Do scanner notification services operate within the law?

"The legal and constitutional issues are complex. The Rapid Media Project tries to sort through these complications in a series of essays. Here is a brief summary of our ideas so far:

- The Ninth Amendment protects a citizen's right to monitor government radio communications, including public safety. Supreme Court opinions support the existence of this right.

- Federal law as currently written preserves access to these communications, but special interests are threatening it.

- The meaning of "the press" is much broader than "the news media," according to a Supreme Court justice. In fact, there appears to be no Constitutional support for the practice of government credentialing of news reporters. All Americans can make use of "the press."

- The First Amendment protects a citizen's right to reveal and discuss the content of government communications with other citizens. Statutory restrictions on such divulgence appear to be unconstitutional, although the Supreme Court has never ruled on this issue directly.

"Anyone interested in the reasoning behind these conclusions is invited to visit The Rapid Media Project at <http://rapid-media.org>. There are feedback links all over the place to make commenting easy. Future plans include an email list for discussion and debate."

NASA Tracking

"Re July 2000 *MT* article, page 10, by Ken Reitz. He suggests checking out one of NASA's tracking programs. The program is down at this writing. May I suggest an excellent tracking program with beautiful graphics, that I have been using for RS-13 and 15. It is very accurate, within seconds at my location. The actual tracking part of the program is called J-Pass. There are other options, but for tracking one or two individual satellites, J-Pass can't be beat. Go to: liffot.msfc.nasa.gov and browse the options. It's always there."

— W18O, Bernie Shunk via email

We enjoy your letters and comments. Write Letters to the Editor, PO Box 98, Brasstown, NC 28902, email mteditor@grove-ent.com, or go directly to *MT* readers via the *MT* chat board at www.monitoringtimes.com

— Rachel Baughn, Editor

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Radio Honor Roll

REACT Seeks to Enlist FRS Channel 1

Eleven year old Kristopher Moore was a somewhat accidental hero as he had to be convinced that the mayday call on his Family Radio Service radio was for real. A group of hikers lost on Palomar Mountain, California, used their FRS radios to call for help. They finally reached Kristopher, whose radio happened to be the same brand and stationed on the same frequency and tone. Kristopher contacted a ranger, who used the radio to talk the group down safely.

REACT (Radio Emergency Associated Communications Teams) is proposing the adoption of Channel 1 (462.5625 MHz) in all FRS radios to be an official "call channel" with the "privacy" tone disabled. It took these hikers 40 minutes of calling to find a radio tuned to the same frequency and tone. With 14 different channels and 38 different CTCSS codes, that's a maximum of 532 possible combinations.

REACT would like to narrow those odds; they are asking manufacturers to recommend to users that they set aside Channel 1 as an emergency call channel. They are also seeking the support of agencies such as the National Park Service to publicize the "Call Channel" as a common frequency to be used in case of emergency. In spite of their short range of operation, the thousands of FRS units now in use could mean many more potential "heroes" listening for a call for help.

Making Trouble for Scanner Listeners

National Public Radio aired a story in July on voyeurism, as a trailer to a story on the TV show *Real World*. Once again scanners got caught in the flak, as Noah Adams interviewed Robin Rimbaud, aka "Scanner" – a "performance artist" who records and remixes people's cell phone conversations. According to two of our contributors, no mention was made on the program that this practice was illegal.

Reader Fred Czubak commented, "This is not harmless techno voyeurism, it is criminal activity. Monitoring cellular telephone conversations is a violation of federal law. Promoting this kind of illegal behavior only feeds the fears of the public and adds fuel to the fires of those who wish to place further restrictions upon the activities of law-abiding radio hobbyists."

FBI Seizures Stale News

A sharp-eyed reader caught a Legal Notice in *The New York Times*, listing state by state property seizures by the FBI. Significant in the Northern Illinois entry were eight cases in which scanners and receivers were seized because they were able to receive cellular frequencies. The majority of these were shipped from Canada, though some came from Great Britain. Oddly, however, while all the listings for other states

were current, a closer look revealed that these Wire Interception seizures were all dated 1997 – the same seizures *MT* reported three years ago. Why this notice appears just now in *The New York Times* is an interesting puzzle!

Digital Radio Parties Join Forces

To help speed up the development of digital radio, the two competitors already committed to the project – USA Digital Radio and Lucent Digital Radio – have decided to form a partnership entitled iBiquity Digital Corp. iBiquity will work together with the FCC, the consumer electronics industry, and broadcast equipment makers to help devise a workable standard so that product development may begin.

FCC Says Take a Number

The FCC has begun implementing a new agency-wide registration system that is even more universal than the newly-implemented Universal Licensing System, or ULS, registration. The Commission Registration System, known as CORES, will assign a unique 10-digit FCC Registration Number (FRN) to all registrants.

For the time being, using an FRN is voluntary. Eventually, CORES registration will supplant ULS registration, though the ULS will remain the licensing database system for Wireless Telecommunications Bureau licensees, including amateurs.

Amateurs who registered in the ULS prior to June 22 automatically have been registered in CORES and will receive an FCC Registration Number in the mail. ULS registrants also may search for their FRN on-line at the FCC's CORES Web site.

For more information on CORES/FRN go to www.arrrl.org/announce/regulatory/da001596.pdf or www.fcc.gov.

Historic Studio Closes

The Electro-Vox studio in Los Angeles that recorded the first wireless broadcasts from the West Coast closed at the end of June 2000 after 69 years of operation. Founder Bert Gottschalk moved from recording sound for the early talkies to recording East Coast radio broadcasts for review. Writers and actors would listen for needed changes to the script before transmission to the West Coast. It was Bert Gottschalk who coined the word "aircheck" for these recordings. Bert's son Alan grew up at the studio, and took it over in the mid-60s. Now that they are both 69, Alan Gottschalk and the Electro-Vox studio are retiring together.

Scanning System Squabbles

Motorola has filed suit against the State of Florida, claiming closed meetings violated the state's own Sunshine laws regulating open meetings. The meetings resulted in \$300 million in radio contracts going to Motorola's competitor, Com-Net Ericsson. See Tracking the Trunks (p.80) for more on the situation.

Tracking the Trunks also reports on the Or-

ange County California, which has imposed a freeze on further build-out of its Motorola system until coverage problems are addressed.

Earth Gets Blasted

In June and July the strongest storms of this 11-year solar cycle sent clouds of ionized gas and electromagnetic energy barreling toward the earth at 1.6 million miles per hour. Some regions have experienced radio blackouts, disruptions in radio communications especially on HF, and auroral displays as low as 40 degrees latitude. We have heard no reports of power outages or major satellite failure due to the solar activity.

eViruses can jump species

Viruses spread by email may pose a danger not only to your computer as appliances become increasingly interconnected. An email virus in Spain recently tried to attack a wireless phone system by overloading it with text messages for customers. The same program could easily be altered to attack pagers, mobile phones, and other portable devices such as pocket sized computers.

With new technologies in the works like Bluetooth (see feature article in this issue), intelligent refrigerators, next generation car navi-



8/31-9/4: Lima, OH

National Radio Club (NRC) convention. Location: Hampton Inn, 1933 Roschman Avenue (Intersection of I-75 and State Route 309; 419-225-8300; FAX 419-225-8328). \$40.00 registration includes all beverages, snacks, and N.R.C. Banquet. Picnic dinner 5 - 7p.m. Friday. Visit www.nrcdxas.org for details or write Frederick R. Vobbe, 706 Mackenzie Drive, Lima OH 45805-1835; 419-228-4199. Convention@nrcdxas.org Talk-in 145.370 (input 144.770), 443.625 (input 448.625), or 53.630 (input 52.630). PL is 100.0 hertz on all repeaters.

September 10: Bethpage, NY

Long Island Hamfair and Electronics Flea Market at Briarcliffe College, 1055 Stewart Avenue, rain or shine; Talk-in 146.850 (PL-136.5). Gen admission \$6, under 12 free. Ham equipment, SW radios, scanners, CB equip, accessories, etc. Call 24 hr hotline 516-520-9311 or visit www.limarc.org

September 16: White Plains, NY

Hudson Division Convention, sponsored by Westchester Emergency Communications Association, at the Westchester County Center. 8am-2pm. Gen adm \$6. Talk-in on 147.06 PL 114.8. Forums, license exams, ARRL officials, commercial vendors and a large flea market (no tailgating). Call the WECA hotline at 914-741-6606, or visit: www.hudsonconvention.org

September 21: Newtown, CT

Western CT Hamfest at Edmond Town Hall, (Rt 6, Exit 10 on I-84) 9a.m. to 2p.m.; Talk-in 146.67(-) PL100. New equipment dealers, flea market, tailgating, computers, refreshments. Admission \$4 (under 12 free). For more info contact Seab Lyon AA1MY, 12 Willow Street, Beacon, NY 12508.

gation, etc. the mischief that could be done from outside your home boggles the imagination. Hopefully manufacturers *have* imagined it – and are building electronic safeguards into their vision of the smart house of the future.

Joe Radio Dies

Brian Cathcart, author of two Florida scanning books, wishes to acknowledge the passing of a scanner friend, Joseph Heleringer. Better known as “Joe Radio,” Heleringer died July 11 from complications from brain cancer. He owned and operated the “Joe Radio Company,” a fire incident notification service in Deerfield Beach. Says Brian (alias the Scanner Dude), “He was an avid scanner listener, monitoring every fire department from Martin County south to Miami. Joe’s radio shack was filled with nu-

merous Trunk Trackers and other scanners, all of which ran 24 hours a day (sometimes he would too). He was a great ‘people person’ with a terrific sense of humor, very down to earth, and always willing to help a friend in need.”

“Communications” is compiled from your newspaper “clippings” by editor Rachel Baughn. Thanks to this month’s reporters: Anonymous, Albany, NY; MH(?), Austin, TX; Ken Hydeman, Xenia, OH; Maryanne Kehoe, Atlanta, GA; Sterling Marcher, La Mirada, CA; Jim Ososki, Rice, MN; Doug Robertson, Oxnard, CA; George Zeller, Cleveland, OH. **Via email:** Kevin Carey, Mark Cobbledick, FJ Czubak, Dick Milligan, Laura Quarantiello, J. Stanley, Larry Van Horn, Scott Westerman, Robert Wyman. Thanks also to ARRL, Deutsche Welle, EDXP, and REACT Intl.

Bill Cheek: The Passing of a Friend

By Bob Grove, Publisher

While it may be inevitable for all of us, it is no less tragic when we lose someone who has left his mark on our industry. With the passing of Bill Cheek at noon on Saturday, July 22, 2000, a chapter of radio closes.

Bill was one of those dynamic forces who cut his niche in radio at an early age. Active in CB during its halcyon period of the ‘70s, he formed his own company, Commtronics Engineering. His publications, products, and services were eagerly sought by radio hobbyists.

Most *MT* readers will remember Bill primarily for his Experimenters Workshop column, one of our most popular pages. Scanner modifications were his delight, adding memory channels, extending frequency coverage, clarifying audio – whatever would improve a product. In more recent years, that included dragging us into the world of microchips and computers, which he correctly forecast as scanning’s leading edge.

Other readers, especially those active on the Internet news groups and bulletin boards, were often embroiled in Bill’s art of self-expression. Oh, he was opinionated, but he was also erudite, and one could almost imagine the smoke pouring from his hot keyboard as he sat late at night, replying to someone’s moral outrage – no holds barred!



I was one of those. I couldn’t believe the things that Bill was saying about me, all the while writing for me! Readers couldn’t believe I’d keep him on staff, much less continue to pay him!

But the more I responded to Bill, the more sense he seemed to make. Sure, his choice of language seemed somewhat inhospitable, but that was Bill’s style. We became good friends over the ‘net, and our mutual respect resulted in more years of Bill’s contributions to the radio art.

Bill mellowed with time, but the unexpected, early morning, violent intrusion into his home by federal and local police authorities took its toll on both Bill and his wife Cindy. Bill had been openly advertising and selling hardware and software that investigators thought might have been in violation of federal law. The case has never gotten to court.

As if this sobering experience weren’t enough, it was soon followed by the discovery that he had incurable cancer. While Bill vowed to fight it, the progress of the disease was immutable, and Bill succumbed.

The *MT* family expresses both our appreciation for the incalculable contributions Bill Cheek made to radio during his active lifetime, as well as our most profound sympathy to Cindy and her family in their loss.

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FAR EASTERN RENDEZVOUS

A fresh, on-the-ground look at HF broadcasting from Malaysia, Vietnam and Singapore

By Bob Padula

Author's note:

Much of the information in this story was gleaned from my journey to Malaysia and Vietnam in June 2000, accompanied by my little Sangean ATS808A portable receiver. In between enjoying the sights and scenes of the places visited, I was able to check out HF broadcasting from several countries bordering the South China Sea, the results of which I would now like to share with you. In particular I will discuss Malaysia, Singapore, and Vietnam, all offering intriguing, if at times frustrating, HF monitoring opportunities.

The Far East has always held a mysterious fascination to me. As a schoolboy in the 1950s, I was thrilled by the English programs of Radio France Asie, the Voice of France in the Far East, using 15430 every night at 0915 for its broadcasts to Australia from its transmitter in Saigon, South Vietnam. That station is now long gone, having closed down in 1956, but its memory lingers, and in the decades since, my hobby of HF monitoring has concentrated more and more on the Asian and Far East region.

From a global DXing perspective, HF broadcasting from the countries surrounding the South China Sea offers many interesting targets, ranging from high powered international broadcast-

ers to very low power local stations situated in the mountains of Indochina.

Malaysia itself extends about 1500 km, with the capital Kuala Lumpur in the far west of Eastern Malaysia, Sarawak in the centre, and Sabah (formerly known as British North Borneo) in the east. On a clear day, the westerly islands of the Philippines may be seen from the top of rugged Mt Kinabalu, the highest peak in Southeast Asia, of some 4300 meters, dominating the capital, Kota Kinabalu.

Vietnam is an S-shaped country, with about 1000 km of coastline running from the Mekong Delta in the south, up to the Chinese border in the north. Vietnam's capital is Hanoi, but Ho Chi Minh city (formerly Saigon) has become the growing national commercial hub.

To the south of Malaysia is the Indonesian Archipelago and the Republic of Singapore. Thailand, Cambodia and Myanmar border Vietnam to the west.

Domestic Radio Broadcasting

Domestic radio broadcasting within Vietnam, Singapore and Malaysia is moving away from traditional MF and HF facilities, being superseded by state-of-the-art VHF transmission networks, supported by high technology computer-based programming production techniques. Much of this is being provided through financial aid packages and heavy investment from developed countries bordering the region. For example, Australia has injected substantial

funds, technical training, expertise and telecommunications' equipment provisioning into Vietnam, as part of its AUSAID program.

There are no longer any MF transmitters in Singapore, these having been replaced by modern and more-efficient VHF networks. Antiquated HF installations in Sarawak have been progressively closed down in favor of VHF in regional areas. In Vietnam there is gradual extension of VHF coverage into rural areas.

When in Vietnam, I was amazed at the relative paucity of local MF and VHF operations, with transmissions mainly confined to the national networks 1 and 2, originating from Hanoi, supplemented by a small array of local stations in the provinces. Private and commercial stations do not exist!

HF domestic radio broadcasting in the region is generally in support of two main objectives: coverage into isolated or rural areas not adequately served by existing MF or VHF facilities, and as primary or back-up program links (feeders) for distribution of programming to local broadcasters.

MALAYSIA

The Department of Broadcasting of Malaya was established in 1946, and known as Radio Malaya. It was originally administered from Singapore, but the name was changed to Radio Malaysia after the formation of Malaysia in 1963.

- **Peninsular Malaysia.** Radio Malaysia operates eight networks from the capital, Kuala Lumpur on VHF and MF, and relays on HF are:

Radio 1 - Malay 24 hours 5965
Radio 4 - English 24 hours 7295
Radio 6 - Indian languages 24 hours 4845
Radio 7 and 8 - Malay and indigenous languages 0400-1300 6025

The above broadcasts are transmitted from the Kajang site, about 30 km south of Kuala Lumpur. At this site there are one 50 kW, nine 10 kW and two 500 kW transmitters. Only the 100 kW units are dedicated for domestic broadcasts.

- **Sarawak.** Radio Malaysia Sarawak runs a comprehensive and complicated broadcasting network, with several regional stations on MF and VHF. HF services are through 10kW transmitters from:

Kuching 4895 5030 7130 and 7270
Sibu 6050

In recent years, several HF transmitters in Sarawak have been taken out of service, and there is no longer any broadcast on HF from Miri, formerly operating on 3385 and 6060. However, some programming originating in the Miri studio is carried on the Sibu HF transmitter on 6050. All of the former 9 MHz outlets at Kuching were phased out in the mid-1970s when new HF transmitters were installed at Miri and Sibu.

It would appear that only four HF transmitters are available for simultaneous use now from Kuching, and at most times only three are on the air. The schedule is variable, with different patterns noted for weekdays, weekends, festivals, and public holidays. The overall transmission span is from 2200-1500, with 7130 used during local daytime for schools, Mandarin, English and indigenous language services. There are breaks during the day when no HF transmitters are operating, such as between 0300 and 0400.

- **Sabah.** Only one HF transmitter is currently in use, on 5979 (nominally 5980), 10 kW, for relay of the MF and VHF service in English. This is on the air from 0330-1000, with a variable sign-off time. The former transmitter on 4970 is inactive, which was previously used for relaying Malay programming. The HF installation is located at Tuaran, a coastal resort area some 30 km north of Kota Kinabalu.



The Reunification Express goes between Ho Chi Minh City and Hanoi

SINGAPORE

Singapore's first national broadcasting service was set up in 1935 by the British Malaya Broadcasting Corporation, a private commercial organization. With the fall of Singapore in 1942, radio broadcasting came under the control of the Japanese Military with the name of Suyonan Hoso Kyoki. After the war, the British established Radio Malaya. With the independence of the Federation of Malaya in 1957, Radio Singapore was set up as an independent offshoot of Radio Malaya, in MF and HF in English, Chinese dialects, Tamil and Malay.

In 1965, Radio Singapore was renamed Radio Television Singapore, and in 1980 was again renamed as the Singapore Broadcasting Corporation. In 1994, the SBC was dissolved and the Radio Corporation of Singapore (RCS) was established as a private corporation with Singapore International Media as the holding company.

RCS operates 12 stations on VHF. HF relays are:

| UTC | Freq kHz |
|---------------------------------|----------|
| English 2300-1100 and 1400-1600 | 6150 |
| Chinese 2300-1100 and 1400-1600 | 6000 |
| Malay 2300-1000 and 1400-1600 | 7235 |
| Indian 2300-1600 | 7170 |

VIETNAM

Broadcasting in Vietnam is Government controlled, under the Dai Tieng Noi Viet Nam (TNVN - Radio The Voice of Vietnam), part of the Vietnam Radio and TV Commission, and its origins can be traced back to August 1945, just before the declaration of independence in September of that year. Its studios and administration center is in downtown Hanoi, at 58 Quan Su Street, operating from a nondescript building not far from the French Embassy.

Five domestic networks originate from Hanoi, broadcast on MF, HF, and VHF:

Channel 1: Vietnamese 2200-1600 MF, HF, and VHF

Channel 2: Vietnamese 2200-1600 MF, HF, VHF

Channel 3: Vietnamese VHF only

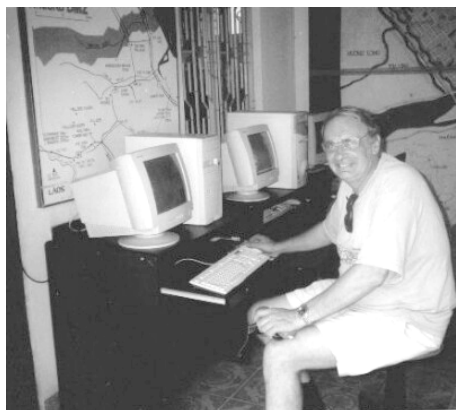
Channel 4: H'mong Service, part of the ethnic minority service, HF only

Channel 5: English, Russian, French and Vietnamese, news and music for foreigners in Vietnam, VHF only from Hanoi, Ho Chi Minh City, Hai Phong and Vung Tau

- **HF Relays.** There are five high powered HF transmitters on the air continuously from 2200-1600, using 5925, 5970, 6020, 7115 and 7210, carrying relays of the National and Provincial Networks. These transmitters, and their associated antennas, are believed to be relatively recent installations, as frequency stability, signal effectiveness, and modulation quality are observed as very good.

Transmitter locations for these five outlets are not known. Based on monitoring observations from Vietnam and Malaysia, as well as from my home location in Melbourne, Australia, I believe that the general sites are as follows:





The author checks his mail at an internet cafe in Hue, Vietnam.

7210: South, likely near Ho Chi Minh City
 7115: North, likely near Hanoi
 6020: South, likely near Ho Chi Minh City
 5925: North, likely near Hanoi
 5970: South, likely near Ho Chi Minh City

All five channels carry the National Network news from Hanoi at 2300-2315. Between 1200-1230, corresponding to 7pm local time, four separate programs are heard, carrying the following services:

7210 - Network 1
 5970 - Provincial Network
 5925 - Network 2
 7115 - Network 1
 6020 - Regional Network

The schedule for each outlet is complex, as each frequency is not dedicated permanently to a particular "Network."

- Regional Transmitters. There is a handful of HF stations located in various provinces, mainly in the mountainous regions to the west and north of Hanoi, and one in the south, in Gia Lai Province. These HF outlets present interesting DX targets, as frequency and operating stability are not of a high order! Many of them have been in use for a great many years dating back to the early 1970s.

These antiquated facilities carry relays of the National Networks, as well as local and regional programming. They tend to operate for limited periods of up to two hours, typically in the early mornings (commencing at 2200), at late-mornings (from 0300), and in the early evening (from about 1000).

As well as Vietnamese and dialects, languages heard include Lao, Thai, Cantonese, Khmer, and Korean. Relays of the National Networks from Hanoi are also broadcast over these facilities at various times. They do not appear to be official transmitters operated by TNVN.

Stations known to be on the air are as follows:

| | |
|--------------------------|-----------------------------|
| 4212 - Lai Chau Province | 6382 - Lai Chau Province |
| 4722 - Gia Lai Province | 6451 - Thai Nguyen Province |
| 4796 - So'n La Province | 6500 - Cao Bang Province |
| 5595 - Lao Cai Province | 6695 - Lao Cai Province |
| 6347 - Yen Bai Province | 7156 - Ha Giang Province |

Actual locations of these transmitters are not known, but identification announcements at the start of each broadcast usually give the name of the province, and often the town or city. Accurate identification can be quite difficult, due to the similarity of some words to our Western ears. Note that many provinces take the same name as the main town or city (such as S'On La, Lai Chau, Lao Cai, Ha Giang). An exception to this is Gia Lai Province, whose capital city is Play Ku.

Announcements usually are of the form: "Day la dai phat thanh...(station name)."

Operating frequencies of most of these transmitters vary from hour to hour, and from day to day, with fluctuations of up to 50 kHz! Some are not on the air each day, and broadcasting times are subject to constant change.

Reports of Vietnamese HF regional stations located in other provinces appear from time to time in the hobby press, but often turn out to be drifting transmitters of existing stations, or broadcasters from other parts of Asia. There has never been any "official" information provided by the Vietnamese authorities on these HF operations, either pre- or post-Reunification. The outlet believed to be in Gia Lai Province was first reported in the early 1980s.

It should be noted that not all broadcasts in Vietnamese in the 60 meter Tropical Band MHz band are from Vietnam! The Yunnan Broadcasting Station, at Nanning, transmits special external transmissions in Vietnamese on 6035 and 5035 at 2200-0130 and 1000-1300, which are often misidentified as being from Vietnam. China Radio International broadcasts in Vietnamese six times daily, at various times, using 5260 as a feeder frequency.

External Broadcasting

The three countries studied all have external broadcasting services, two of which – Malaysia and Vietnam – target audiences worldwide.

MALAYSIA

The **Voice of Malaysia** (Suara Malaysia) was set up in 1963, with an objective of projecting Malaysia overseas, to foster friendly relations with Malaysia's neighbors and to broadcast to Malaysians living in other countries.

The station uses four HF and one MF transmitters. HF is broadcast from the Kajang site, where two 500 kW transmitters are in use, inaugurated in 1982, and two 100 kW transmitters. MF is broadcast from a 600 kW transmitter on 1476 kHz located at the Radio Malaysia Sabah facility at Tuaran.

The schedule is:
 6025 1400-1600 Malay
 (Voice of Islam)

| | |
|---------------|--|
| 6100 | 1300-1430 Thai, 1430-1530 Vietnamese, 2200-2355 Indonesian |
| 6175 and 9750 | 0300-0655 English (Voice of Islam), 0655-0825 English, 0900-1400 Indonesian, 1400-1600 Malay (Voice of Islam), 1530-1700 Arabic, 1700-1900 Malay, 2200-2355 Indonesian |
| 11885 | 1030-1230 Mandarin and Cantonese |
| 15295 | 0300-0655 English (Voice of Islam), 0655-0825 English, 0830-1025 Malay, 1030-1230 Mandarin and Cantonese, 1530-1700 Arabic, 1700-1900 Malay |

The Voice of Islam is a separate entity from the Voice of Malaysia, using the same transmitting facilities.

SINGAPORE

Radio Singapore International is the overseas HF service of the RCS, and started in 1994. Its target areas are Malaysia, Indonesia, Brunei, and South East Asian countries, within a span of 1600 km from Singapore. Its schedule is:

| | | |
|------------|-----------|-----------|
| Mandarin | 1100-1400 | 6000 6120 |
| English | 1100-1400 | 9590 6150 |
| Indonesian | 1200-1400 | 9665 |
| Malay | 1000-1200 | 9665 7235 |

Transmitters are at the Seletar site, also used for HF domestic broadcasting.

Merlin Communications operates the large HF complex at Kranji, which commenced under the control of the BBC in 1978. Initially there were eight transmitters which had been transferred from the SBC's relay at Terbia, in Malaysia. There are now nine transmitters there, five of 250 kW and four of 100 kW. In 1997 the BBC sold the facility to Merlin, which now leases transmission capacity to various broadcasters, including the BBC, Radio Japan, Swiss Radio International, Radio Telfis Eireaan, Radio Netherlands, RAI and Radio Canada International.

A multi-lingual archived audio service is also available at <http://rsi.com.sg>



A street scene in Hanoi, Vietnam



Bob Padula and his bike in the village of Tengah, Langkawi Island.

VIETNAM

It is believed that two principal HF sites are in use for external broadcasting. The first is at Son Tay (with two 100 kW transmitters), located about 30 km NW of Hanoi. Son Tay is in Ha Tay Province, which borders the Hanoi region. The second site is at Mi Tri, about 5 km SW of Hanoi, with one 50 kW transmitter. Only two transmitters are in use from the Son Tay site at any given time for the external service.

In recent years, the number of Vietnamese-based transmitters used for the external service has been reduced, and reports suggest that these have been diverted for jamming of Radio Free Asia broadcasts. The number and location of these are unknown.

The Mi Tri site has the transmitter which operates on the single frequency of 7285, 50 kW, with an antenna azimuth of 216 degrees, and it's used for the external service 0000-0100 and 1100-1530 in various Asian languages, including English 1100-1130:

Of particular interest is that output on this frequency has recently been extended, and is now used for relaying National Network programming from Hanoi, when not engaged for the regular external service. This is from 0100-1100 with relays of Networks 1 or 2. This is to augment national daytime coverage into the southern part of the country of the HF relays on 5925, 5970, 6020, 7115 and 7210. 7285 offered excellent reception during the daytime period throughout Vietnam and all of Malaysia. However, 7285 is also used by Radio Taipei International from 1200-1400 and by the Voice of Asia (Taiwan) 1000-1100.

The following frequencies are in use from Son Tay for the designated External Service transmission blocks, for the international broadcast period which concludes on October 29, 2000:

9730 and 13740: 0000-0100, 1100-1130, 1300-1400, 1600-2130
9840 and 12020: 0830-1100, 1130-1300, 1400-1600, 2130-0000

English programming is broadcast at:

9840 and 12020: 1000-1030, 1230-1300, 2330-0000
9730 and 13740: 1330-1400, 1600-1630, 1800-1830, 1900-1930, 2030-2100

There is also a high powered MF transmitter operating on 1242 kHz from Hanoi, between 0900 and 1700, and from 2200-0000, for External Services, carrying programming in Vietnamese, English, Indonesian, Cambodian, Thai, French, Cantonese, Mandarin, and Lao, with some of this output in parallel with the HF External Services.

External Service Relays. The Voice of Vietnam uses relays in Canada (Sackville) and Russia (Serpukhov and Moscow) for reaching audiences in the Americas and Europe respectively. Until October 29, 2000, these relays are scheduled as follows:

9695 (via Sackville):
0100-0130 English
0130-0230 Vietnamese
0230-0300 English
9795 (via Sackville):
0300-0330 Spanish
0330-0400 English
0400-0500 Vietnamese
12070 (via Serpukhov):
1700-1730 English
1730-1830 Vietnamese
1830-1900 French
12030 (via Serpukhov):
1900-1930 Russian
1930-2030 Vietnamese
7440 (via Moscow):
1900-1930 Russian

The complete External service schedule is available for viewing or downloading from: www.vov.org.vn/docs1/english/history/international.html

Summation

It is my view that all domestic HF broadcasting in the three countries discussed will be phased out entirely, in preference to VHF-FM. Distinct trends are already in evidence, particularly in Malaysia, where some HF transmitters and their associated antennas are decades old.

From what I saw during my travels, there is a negligible market in the region for shortwave radio receivers for domestic application, with the population preferring VHF-FM. As ancient HF transmitters and antennas fail, they tend not to be repaired. In Malaysia, rural communities are being progressively introduced to VHF services, due to the expansion of microwave transmission networks across the country, and it is only in isolated remote rural districts where traditional domestic HF radio has any sort of impact.

If this story has sparked, or rekindled your interest in HF broadcasting from the mysterious Far East, then my aim in preparing it will have been realized.

About the Author:

Bob Padula, of Melbourne, Australia, convenes the ELECTRONIC DX PRESS (EDXP) on a voluntary, hobby basis. Bob is a Consultant Professional Communications Engineer and a freelance technical writer, and he's been actively involved with the radio monitoring (DXing) movement for some 43 years. He's a foundation and Life Member of the Australian Radio DX Club Incorporated, and holds the Australian Government Award of the Medal of the Order of Australia, (OAM) for services rendered in a voluntary capacity to shortwave radio. His other interests are cycling, bushwalking, ancient astronauts, and travelling. His radio gear is a National DR49, Sangean ATS808A, and Yaesu FRG8800, fed via two dipoles at 5 and 11 MHz. He has some 7700 shortwave QSLs, collected over the period 1954 to the present.

PROPAGATION FORECASTING

JACQUES D'AVIGNON, VE3VIA
248 TOWERHILL ROAD
PETERBOROUGH, ON K9H 7N1
CANADA

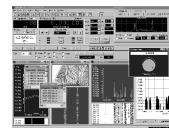
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Guide to QSL Addresses Asia and Pacific

by Gayle Van Horn

NHK Radio Japan postcard

In the early days of radio, stations depended upon reception reports from their listeners. Using these reports to create a synopsis of signal quality and program details, a station could judge when, where, and how well their signals were being received.

As the popularity of radio increased, so did listener mail. Stations began an industry rivalry for who received the most reports, the most distant report, and who had the most sought after verification card.

Times have changed for the listener of 2000. Staff cutbacks, rising postage costs, satellite services, Real Audio via the Internet, and even demanding hobbyists, have resulted in many stations abandoning QSLing as an outdated mode of correspondence, much to the chagrin of collectors.

Despite this revelation, my mail indicates that QSLing continues to delight and exasperate the hobbyist. The number one request from *QSL Report* readers remains station addresses and the "how-to" of postage.

Improving Your Rate of Return

This month, we begin the first segment of our *Guide to QSL Addresses* with an initial focus on Asia and the Pacific. Broadcasters from this region vary greatly in letter responses. Collectors agree that QSLing trends can change frequently, particularly in this region. Last month's reply may abruptly cease due to lack of staff or current political unrest. So here are some general tips to help improve your chances.

Among hobbyists, the debate continues over report enclosures of International Reply Coupons (IRC) currency or mint postage stamps. IRCs, though a bit pricey if multiples are used, are available through the post office for \$1.05 each (U.S. funds). By stamping the left side of the coupon, the postal clerk ensures the IRC is exchangeable, in any country that accepts them, for return postage to you.

However convenient, U.S. currency remains a least favored method to ensure funds for return postage. Some stations do accept currency and contributors report success; unfortunately,

with rising reports of postal theft, I do not recommend this unless you are able to discretely enclose it within a registered letter.

For the serious QSL collector, enclosing mint postage stamps has risen in popularity. The best source is *Bill Plum's Airmail Postage and DX Supply* (12 Glenn Road, Flemington, NJ 08822-3322 USA). Send Bill a self-addressed envelope to receive a current price list of postage stamps representing the airmail rate to North America, plus DXing supplies and monthly stamp specials.

Registering your letter is another alternative, which requires the addressee to sign for the letter before taking delivery. Your letter should be sealed securely, leaving room along the flap of the letter for the postal clerk's rubber stamp imprint.

For an additional expense, consider Return Receipt for your registered letter. This could be a solution for your first follow-up, but currently does not appear to be a popular one. Sending the registered letter certified is less expensive and constitutes proof of having mailed the letter.

Perhaps you'd rather not call attention to your letter. Consider using the post office's metered stamp machine, instead of colorful airmail postage stamps, on a plain white #10 business envelope. Fancy stationery, colored envelopes and inks with creative lettering or craft stamping will certainly draw attention to your letter, and possibly land it in someone's back pocket!

Postal aerogrammes, available at the post office, appear to be an inexpensive solution at sixty cents each; however, no enclosures are allowed. This could be an advantage for stations requesting no enclosures such as Cambodia, India, and Laos.

Obtaining verifications from Indonesian broadcasters remain a source of discontent for hobbyists. Several stations from the national Radio Republik Indonesia network will respond to English reports; however, a report in Indonesian will likely ensure a reply, as well as a prepared QSL card for the station to sign and return to you. Indonesian reporting and translating are available through various software and online translation services. (See *Monitoring Times*, *QSL Report/August 2000*). Also consider

the Voice of Indonesia's daily English broadcast, that is fairly easy to hear and verify

Opinions differ as to the value of an IRC or mint postage to Indonesia. Most experts believe IRCs are of minimal help since few Indonesian stations understand what they are used for. Enclosing mint stamps and a self-addressed envelope with your report have proved more successful.

QSLing trends for stations of the Pacific, except for Kiribati, Solomon Islands, and Vanuatu, remain good to fairly easy to verify. All accept English reports, as well as mint stamps or IRCs.

Papua New Guinea provincial stations remain fair to easy to verify. English reports are usually verified within three to four months. Stations from this region intermittently leave and reappear abruptly as do many Indonesians, so persistence is a requirement.

QSLing via transmitter sites is an excellent way to add countries. Most stations, with the exception of BBC relays, respond in two or three months. Usually the site will be noted if you request it in your report.

Collecting souvenirs and promotional items can be just as pleasurable as the verification. Do not hesitate to politely ask in your letter if any might be available. Colorful pennants, magazines, books and T-shirts continue to enthrall DXers.

This month's station addresses include current enclosure suggestions for each country. Updates and corrections are welcome. Next month we'll delve into the tips and addresses for Africa, a continent where broadcasting and QSLing can adjust daily.

Verifying stations of Pacific-Asia can be rewarding. Hopefully your verified rate will improve by following our tips and addresses. Make it a practice to re-examine your reports to improve, adjust and experiment. A proven method that worked beautifully last week may elude you tomorrow.

Admittedly, there will always remain stations that will not respond, despite your best intentions. There is no magic or special secret to QSLing, except perhaps creativity and persistence.

ASIA

Bangladesh

(Very irregular, 1-2 IRCs, registered may improve your reply)
Bangladesh Betar
External Services
Shahbagh Post Box No. 2204
Dhaka 1000, Bangladesh

Bhutan (Kingdom of)

(Very irregular, 2 IRCs or \$1.00 required, report to UN may improve reply)
Bhutan Broadcasting Service
Department of Information & Broadcasting
Ministry of Communications
P.O. Box 101
Thimphu, Bhutan
(or)
Permanent Mission of the Kingdom of Bhutan to the United Nations
Two United Nations Plaza
27th Floor
New York, NY 10017 USA

Cambodia (Kingdom of)

(Irregular, do not send IRCs, stamps or currency)
National Radio of Cambodia
106 Preah Kosamak Street
Monivong Boulevard
Phnom Penh, Cambodia

China (People's Republic of)

(China Radio International remains an excellent verifier, with souvenirs available. They will occasionally verify Chinese regional stations if requested in your report)

Central People's Broadcasting Station (CPBS)/
China National Radio
Zhongyang Renmin Guangbo Diantai
P.O. Box 4501
Beijing 100866, China

China Huayi Broadcasting Company
P.O. Box 251
Fuzhou, Fujian 350001, China

China Radio International/Non-Chinese Service
16A Shijingshan Street
Beijing 100040, China

Fujian People's Broadcasting Station
2 Gutian Lu
Fuzhou, Fujian 350001, China

Gansu People's Broadcasting Station
226 Donggang Xilu
Lanzhou 730000, China

Guangxi People's Broadcasting Station
12 Min Zu Avenue
Nanning
Guangxi 530022, China

Guizhou People's Broadcasting Station
259 Qingyun Lu
Guiyang
Guizhou 550002, China

Heilongjiang People's Broadcasting Station
181 Zhongshan Lu
Harbin
Heilongjiang 150001, China

Hong Kong People's Broadcasting Station
32 Jianshe Donglu
Gejiu
Yunnan 661400, China

Hubei People's Broadcasting Station
563 Jiefang Dadao
Wuhan, Hubei 430022, China

Hunan People's Broadcasting Station
27 Yuhua Lu
Changsha, Hunan 410007, China

Jiangxi People's Broadcasting Station
111 Hongdu Zhong Dadao
Nanchang, Jiangxi 330046, China

Nei Menggu/Inner Mongolia/People's Broadcasting Station

19 Xinhua Darjiej Hohhot
Nei Menggu 010058, China

Qinghai People's Broadcasting Station
96 Kunlun Lu
Xining, Qinghai 810001, China

Radio Exterior de Espana relay
Apartado de Correos 156.202
28080 Madrid, Spain

Sichua People's Broadcasting Station
119-1 Hongxing Zhonglu
Chengdu
Sichuan 610017, China

Voice of Jinling
P.O. Box 268
Nanjing
Jiangsu 210002, China

Voice of Pujiang
P.O. Box 3064
Shanghai 200002, China

Voice of the Strait
People's Liberation Army Broadcasting Centre
P.O. Box 187
Fuzhou, Fujian 350012, China

Wenzhou People's Broadcasting Station
19 Xianxue Qianlu
Wenzhou, Zhejiang 325000, China

Xilinqal People's Broadcasting Station
Xilin Daijie
Xilinhot, Nei Menggu 026000, China

Xinjiang People's Broadcasting Station
84 Tuanjie Lu
Urumqi, Xinjiang 830044, China

Xizang People's Broadcasting Station
180 Beijing Zhonglu
Lhasa, Xizang 850000, China

Yunnan People's Broadcasting Station
73 Renmin Xilu
Central Building of Broadcasting & TV
Kunming, 650031 Yunnan, China

Zhejiang People's Broadcasting Station
11 Wulin Xiang
Moganshan Lu
Hangzhou, Zhejiang 310005, China

China (Republic of) (Taiwan)

(Good, 1 IRC helpful but not required, souvenirs available)
Central Broadcasting System/CBS
55 Pei'an Road
Tachih
Taipei 104
Taiwan, Republic of China

Radio Taipei International
P.O. Box 24-38
Taipei 106
Taiwan, Republic of China

Voice of Asia
P.O. Box 24-777
Taipei
Taiwan, Republic of China

Radio Portugal relay
RDP International/Radio Portugal
Apartado 1011
1001 Lisbon, Portugal

India

(Fair-irregular, mail theft reported. Best to send registered, without enclosures. Sending to New Delhi headquarters may improve your reply)
All India Radio/Aizawl
Radio Tila
Tuikhuahlang
Aizawl-796 001
Mizoram, India

All India Radio/Bangalore
c/o All India Radio External Service Division
Prasar Bharati Corporation Of India
Akashvani Bhawan
Room 204
Sansad Marg



New Delhi - 110 001, India
(or)
P.O. Box 500
New Delhi - 110 001, India

All India Radio/Gangtok
Old MLA Hostel
Gangtok - 737 101
Sikkim, India

All India Radio/Gorakhpur
(domestic service)
Post Bag 26
Gorakhpur - 273 001
Uttar Pradesh, India

(Nepalese service - see All India Radio External Services Division address)

All India Radio/Guwahati
P.O. Box 28
Chandmari
Guwahati - 781 003
Assam, India

All India Radio/Hyderabad
Rocklands
Saitabad
Hyderabad-500 004
Andhra Pradesh, India

All India Radio/Imphal
Palau Road
Imphal-795 001
Manipur, India

All India Radio/Itanagar
Naharlagun
Itanagar-791 110
Arunachal Pradesh, India

All India Radio/Jaipur
5 Park House/Mirza Ismail Road
Jaipur-302 001
Rajasthan, India

All India Radio/Jammu
Radio Kashmir-Jammu
Begum Haveli
Old Palace Road
Jammu-180 001
Jammu & Kashmir, India

All India Radio/Jeyapore
Jeyapore 764 005
Orissa, India

All India Radio/Kohima
Kohima-797 001
Nagaland, India

All India Radio/Kurseong
Mehta Club Building
Kurseong - 734 203
Darjeeling District

West Bengal, India

All India Radio/Leh
Radio Kashmir-Leh
Leh-194 101
Ladakh District
Jammu & Kashmir, India

All India Radio/Lucknow
18 Vidhan Sabha Marg
Lucknow - 226 001
Uttar Pradesh, India

All India Radio/Mumbai
(Commercial Service/Vividh Bharti)
All India Radio
P.O. Box 11497
M.K. Road
Mumbai-400 0020
Maharashtra, India

(Domestic Service)
P.O. Box 13034
Mumbai-400 020
Maharashtra, India

(External Service)
(see All India Radio External Services Division address)

All India Radio/New Delhi
P.O. Box 70
New Delhi - 110 011, India

All India Radio/Panaji
(see All India Radio External Services Division address)

All India Radio/Port Blair
Dilanipur
Port Blair 744 102
South Andaman
Andaman & Nicobar Islands
Union Territory, India

All India Radio/Ranchi
6 Ratu Road
Ranchi - 834 001
Bihar, India

All India Radio/Shilong
P.O. Box 14
Shillong - 793 001
Meghalaya, India

All India Radio/Simla
Chaura Maidan
Simla - 171 004
Himachal Pradesh, India

All India Radio/Srinagar
Radio Kashmir-Srinagar
Sherwani Road
Srinagar - 190 001
Jammu & Kashmir, India

All India Radio/Thiruvananthapuram
P.O. Box 403
Bhakti Vilas
Vazuthacaud
Thiruvananthapuram - 695 014
Kerala, India

Indonesia

(Fair to irregular, mint stamps)
Radio Pemerintah Daerah Kabupaten TK II
RPDK Ende
Jalan Panglima Sudirman
Ende, Flores
Nusa Tenggara Timur, Indonesia

Radio Pemerintah Daerah Kabupaten TK II
RPDK Manggarai
Ruteng, Flores
Nusa Tenggara Timur, Indonesia

Radio Pemerintah Daerah Kabupaten Daerah TK II
RSPDK Ngada
Jalan Soekarno-Hatta
Bijawa, Flores
Nusa Tenggara Tengah, Indonesia

Radio Siaran Pemerintah Daerah TK II
RSPD Halmahera Tengah, Soasio
Jalan A. Malawat
Soasio, Maluku Tengah 97812, Indonesia

Radio Siaran Pemerintah Daerah TK II
RSPD Sumba Timur
Jalan Gajah Mada 10 Hambala
Wangapu, Nusa Tenggara
Timur 87112, Indonesia

Radio Republik Indonesia/RII Ambon
Jalan Jenderal Akhmad Yani 1
Ambon, Maluku, Indonesia

Radio Republik Indonesia/RII Banda Aceh
(when active)
Kotak Pos 112
Banda Aceh, Aceh, Indonesia

Radio Republik Indonesia/RII Bandar Lampung
Kotak Pos 24
Bandar Lampung 35213, Indonesia

Radio Republik Indonesia/RII Bandung
(when active)
Stasiun Regional 1
Kotak Pos 1055
Bandung 40010
Jawa Barat, Indonesia

Radio Republik Indonesia/RII Banjarmasin
(when active)
Stasiun Nusantara 111
Kotak Pos 117
Banjarmasin 70234
Kalimantan Selatan, Indonesia



Radio Republik Indonesia/RRI Bengkulu
Stasiun Regional 1
Kotak Pos 13 Kawat
Katamadya Bengkulu, Indonesia

Radio Republik Indonesia/RRI Biak
(when active)
Kotak Pos 505
Biak, Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Bukittinggi
(when active)
Stasiun Regional 1 Bukittinggi
Jalan Prof. Muhammad Yamin 199
Aurkuning, Bukittinggi 26131
Propinsi Sumatera Barat, Indonesia

Radio Republik Indonesia/RRI Denpasar
(when active)
Kotak Pos 3031
Denpasar 80030
Bali, Indonesia

Radio Republik Indonesia/RRI Dili
(when active)
Stasiun Regional 1 Dili
Jalan Kaikali
Kotak Pos 103
Dili 88000
Timur, Indonesia

Radio Republik Indonesia/RRI Fak Fak
(when active)
Jalan Kapten P. Tendean
Kotak Pos 54
Fak Fak 98601
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Gorontalo
Jalan Jenderal Sudirman
Gorontalo 96128
Sulawesi Utara, Indonesia

Radio Republik Indonesia/RRI Jakarta
Stasiun Nasional Jakarta
Kotak Pos 356
Jakarta
Daerah Khusus Jakarta Raya, Indonesia

Radio Republik Indonesia/RRI Jambi
Jalan Jenderal A. Yani 5
Telanipura
Jambi 36122
Propinsi Jambi, Indonesia

Radio Republik Indonesia/RRI Jayapura
Kotak Pos 1077
Jayapura 99222
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Kendari
Kotak Pos 7
Kendari 93111
Sulawesi Tenggara, Indonesia

Radio Republik Indonesia/RRI Kupang - Region 1
Jalan Toppello 8

Kupang
Timur, Indonesia

Radio Republik Indonesia/RRI Mafun
(when active)
Jalan Mayor Jenderal Panjaitan 10
Mafun
Jawa Timur, Indonesia

Radio Republik Indonesia/RRI Malang
(when active)
Kotak Pos 78
Malang 65112
Jawa Timur, Indonesia

(or) Jalan Candi Panggung No. 58
Mojolangu
Malang 65142, Indonesia

Radio Republik Indonesia/RRI Manado
Kotak Pos 1110
Manado 95124 Propinsi
Sulawesi Utara, Indonesia

Radio Republik Indonesia/RRI Manokwari
Regional II
Jalan Merdeka 68
Manokwari
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Mataram
(when active)
Stasiun Regional I Mataram
Jalan Langka 83 Ampenan
Mataram 83114
Nusa Tenggara Barat, Indonesia

Radio Republik Indonesia/RRI Medan
Jalan Letkol Martinus Lubis 5
Medan 20232

Sumatera, Indonesia

Radio Republik Indonesia/RRI Merauke
Stasiun Regional 1
Kotak Pos 11
Merauke
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Nabire
(when active)
Kotak Pos 110
Jalan Merdeka 74
Nabire 98801, Indonesia

Radio Republik Indonesia/RRI Padang
Kotak Pos 77
Padang 25121
Sumatera Barat, Indonesia

Radio Republik Indonesia/RRI Palangkaraya
Jalan M. Husni Thamrin 1
Palangkaraya 73111
Kalimantan Tengah, Indonesia

Radio Republik Indonesia/RRI Palembang
Jalan Radio 2
Km. 4

Palembang
Sumatera Selatan, Indonesia

Radio Republik Indonesia/RRI Palu
Jalan R.A. Kartini 39
94112 Palu
Sulawesi Tengah, Indonesia

Radio Republik Indonesia/RRI Pekanbaru
Kotak Pos 51
Pekanbaru
Riau, Indonesia

Radio Republik Indonesia/RRI Pontianak
Kotak Pos 1005
Pontianak 78111
Kalimantan Barat, Indonesia

Radio Republik Indonesia/RRI Samarinda
Kotak Pos 45
Samarinda
Kalimantan Timur 75001, Indonesia

Radio Republik Indonesia/RRI Semarang
(when active)
Kotak Pos 1073
Semarang Jateng
Jawa Tengah, Indonesia

Radio Republik Indonesia/RRI Serui
Jalan Pattimura Kotak Pos 19
Serui 98211
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Sibolga
(when active)
Jalan Ade Irma Suryani
Nasution No. 5
Sibolga
Sumatera Utara, Indonesia

Radio Republik Indonesia/RRI Sorong
Kotak Pos 146
Sorong 98414
Irian Jaya, Indonesia

Radio Republik Indonesia/RRI Sumenep
(when active)
Jalan Urip Sumoharjo 26
Sumenep Madura
Jawa Timur, Indonesia

Radio Republik Indonesia/RRI Surabaya
Stasiun Regional 1
Kotak Pos 239
Surabaya 60271
Jawa Timur, Indonesia

Radio Republik Indonesia/RRI Surakarta
(when active)
Kotak Pos 40
Surakarta 57133
Jawa Tengah, Indonesia

Radio Republik Indonesia/RRI Tanjungpinang
Stasiun RRI Regional II Tanjungpinang
Kotak Pos 8

Tanjungpinang 29123
Riau, Indonesia

Radio Republik Indonesia/RRI Ternate
Jalan Kedaton
Ternate
Maluku, Indonesia

Radio Republik Indonesia/RRI Tual
(when active)
Tual
Kepulauan Kai
Maluku, Indonesia

Radio Republik Indonesia/RRI Ujung Pandang
RRI Nusantara IV
Kotak Pos 103
Ujung Pandang
Sulawesi Selatan, Indonesia

Radio Republik Indonesia/RRI Wamena
RRI Regional II
Kotak Pos 10
Wamena
Irian Jaya 99501 Indonesia

Radio Republik Indonesia/RRI Yogyakarta
Jalan Amat Jazuli 4
Kotak Pos 18
Yogyakarta 55224
Jawa Tengah, Indonesia

Voice of Indonesia
Jl. Medan Merdeka Barat 48 5
P.O. Box 1157
Jakarta, Indonesia
(or)
Kotak Pos 1157
Jakarta 10001
Daerah Khusus Jakarta Raya, Indonesia

Japan

(Letters to regional Japanese stations should be sent via registered mail with 1 IRC. Radio Japan is an excellent verifier. 1 IRC helpful but not required, souvenirs available)
NHK/Fukuoka
1-1-10 Ropponmatsu
Chuo-ku
Fukuoka-shi, Fukuoka 810-77, Japan

NHK Osaka
3-43 Bamba-cho
Chuo-ku
Osaka 540-01, Japan

NHK Sapporo
1-1-1 Ohdori Nishi
Chuo-ku
Sapporo 060-8703, Japan

NHK Tokyo/Shobu-Kuki
JOAK
3047-1 Oaza-Sanga
Shobu-cho
Minami Saitamagun, Saitama 346-01, Japan

Radio Japan/NHK World
2-1
Jinnan 2-chome
Sibuya-ku
Tokyo, Japan

Radio Japan/NHK World
External Service
Tokyo 150-8001, Japan

Radio Tampa/NSB
Nihon Shortwave Broadcasting
9-15 Akasaka 1-chome
Minato-ku
Tokyo 107-8373, Japan

Kazakhstan

(Very irregular, registered letters in English, German, French, Kazakh and Russian)
Kazak Radio
175A Zheltoksan Street
480013 Almaty, Kazakhstan

Korea (Democratic People's Republic of)

(Very poor to irregular, remains a sought after QSL, do not include enclosures)
Radio Pyongyang/External Service
Korean Central Broadcasting Station

Pyongyang, Democratic People's Republic of Korea

Korea (Republic of)

(Very good, 1 IRC helpful but not required, souvenirs available)
Korean Broadcasting System/
Radio Korea International
18 Yoido-dong
Yongdangpo-gu
Seoul, Republic of Korea

Kyrgyzstan

(Irregular, Kyrgyz and Russian preferred, English and German accepted with mint stamps)
Kyrgyz Radio
Kyrgyz TV & Radio Center
59 Jash Gvardiya Boulevard
720300 Bishkek, Kyrgyzstan

Laos (People's Democratic Republic)

(Very irregular, French or Laotian reports preferred, registered may assist reply, no enclosures)
Lao National Radio
Boite Postal 310
Vientiane, Laos

Malaysia (Federation of)

(Irregular, \$1.00 or mint stamps preferred)
Radio Malaysia Kota Kinabalu
RTM
88614 Kota Kinabalu
Sabah, Malaysia

Radio Malaysia/Kuala Lumpur
RTM
Angkasapuri
Bukit Putra
50614 Kuala Lumpur
Peninsular Malaysia, Malaysia

Radio Malaysia Sarawak/Kuching
RTM
Broadcasting House
Jalan P. Ramlee
93614 Kuching, Sarawak, Malaysia

Radio Malaysia Sarawak/Miri
RTM
Miri
Sarawak, Malaysia

Radio Malaysia Sarawak/Sibu
RTM
Jabatan Penyiaran
Bangunan Penyiaran
96009 Sibu
Sarawak, Malaysia

Voice of Malaysia
Suara Malaysia
Wisma Radio
P.O. Box 11272-KL
50740 Angkasapuri
Kuala Lumpur, Malaysia

Mongolia

(Fair, 2 IRCs or \$1.00 preferred, souvenirs available)
Radio Mongolia/Voice of Mongolia
Central Post Office Box 365
Ulaanbaatar 13, Mongolia
Myanmar (Union of)
Radio Myanmar
General Post Office 1432
Yangon-11181, Myanmar

Nepal

(Fair, 3 IRCs required. Mint stamps or currency not recommended) due to postal theft)
Radio Nepal
P.O. Box 634
Singha Durbar
Kathmandu, Nepal

Pakistan

(Poor to irregular, 2 IRCs or mint stamps)
Azad Kashmir Radio
Muzaftarabad
Azad Kashmir, Pakistan

Pakistan Broadcasting Corporation/Radio Pakistan
P.O. Box 1393
Islamabad 44000, Pakistan

Philippines (Republic of the)

(Good to fair, 1-2 IRCs or mint stamps)
Far East Broadcasting Company/
FEBC Radio International External Service
P.O. Box 1
Valenzuela
Manila, Philippines

Far East Broadcasting Company
Domestic Service
Bgy. Bayanan Baco Radyo DZB2
c/o ONF Clapan
Orr. Mindoro, Philippines 5200

Radyo Pilipinas/Voice of Democracy
Philippine Broadcasting Service
4th Floor
PIA Building
Visayas Avenue
Quezon City 1166
Manila, Philippines

Radio Veritas Asia
P.O. Box 2642
Quezon City, 1166 Philippines

Voice of America relay
330 Independence Avenue SW
Washington DC 20547 USA

Singapore

(Good, 1 IRC or mint stamps, do not include currency, souvenirs available)
BBC World Service Relay/Far Eastern relay
26 Olive Road, Singapore

(non technical)
c/o BBC World Service
Strand, London WC2B 4PH, United Kingdom

Radio Corporation of Singapore/
Radio Singapore International
Farrer Road
P.O. Box 968
Singapore 912899
(or)
Caldecott Broadcast Centre
Caldecott Hill
Andrew Road
Singapore 299939

Radio Netherlands Singapore relay
(non technical)
Radio Netherlands
P.O. Box 222
1200 JG Hilversum, The Netherlands

(Singaporean transmitters)
(see BBC World Service address)

Radio Japan Singapore relay
(non technical)
c/o Radio Japan/NHK World
Nippon Hoso Kyokai
Tokyo 150-8001, Japan

Radio Telefis Eireann RTE relay
Dublin 4
Ireland

Swiss Radio International relay
Giacomettistrasse 1
CH-3000 Bern 15, Switzerland

Sri Lanka

(Good to fair, 1-2 IRCs)
Deutsche Welle relay
92/2 D.S. Senanayake Mawatha
Colombo 08, Sri Lanka

(non technical)
c/o Deutsche Welle
Raderbergquertel 50
D-50968 Cologne, Germany

IBC-Tamil
P.O. Box 1505
London SW8 2ZH, United Kingdom

Radio Japan/NHK relay
(technical only)
c/o Sri Lanka Broadcasting Corporation
P.O. Box 574
Torrington Square
Colombo 7, Sri Lanka

(non technical)
(see Radio Japan address)

Sri Lanka Broadcasting Corporation
P.O. Box 574
Independence/Torrington Square
Colombo 7, Sri Lanka

Voice of America/BBB relay - Iranawila
(see Voice of America address)

Tajikistan

(Poor, no currency or IRCs)
Radio Tajikistan
Chapoev Street 31
734025 Dushanbe, Tajikistan
(or)
English/International Service
Radio Tajikistan
P.O. Box 108
734025 Dushanbe, Tajikistan

Thailand

(Fair to irregular, 1-2 IRCs)
BBC World Service/Asian relay
P.O. Box 20
Muang Nakhon
Sawan 0000, Thailand

Radio Thailand
236 Vibhavadi Rangsit Highway
Din Daeng
Bangkok 10320, Thailand

Voice of America/Thailand relay
(see Voice of America address)

Turkmenistan

(Very poor, no enclosures)
Radio Turkmenistan
National TV & Radio Broadcasting Company
Mollanepes St. 3
744000 Ashgabat, Turkmenistan

Uzbekistan

(Fair, reports in English, German, Russian, Uzbek, souvenirs available)
Radio Tashkent
49 Khorazm Street
700047 Tashkent, Uzbekistan

Vietnam

(Poor, French reports to domestic stations. Mint stamps or \$1.00 helpful for Voice of Vietnam, no IRCs)
Lam Dong Broadcasting Service
Da Lat
Vietnam
Son La Broadcasting
Son La, Vietnam

Voice of Vietnam/Domestic Service
Voice of Vietnam/Overseas Service
(non technical & verifications)
58 Quan Su Street
Hanoi, Vietnam
(or)
45 Ba Trieu Street
Hanoi, Vietnam

Bac Thai Broadcasting Service
Lai Chau Broadcasting Service
Yen Bai Broadcasting Station
(see Voice of Vietnam Overseas Service address)

PACIFIC

Australia

(Good, mint stamps or 2 IRCs, souvenirs available)

Australian Defence Forces Radio
(when active)
Department of Defence
Electronics Media Unit
ANZAC Park West
APW 1-B-07
Reid
Canberra ACT 2601, Australia

BBC World Service via Radio Australia
(technical)
Radio Australia
GPO Box 4286

RADIO VANUATU

N
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R
V
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E



Slit Gong (Tam Tam) from Ambrym Island, used in village to village communications and in custom ceremonies.

Melbourne VIC 3001 Australia
(non technical)
(see BBC World Service address)

CAAMA Radio ABR
Central Australian Aboriginal Media Association
Bush Radio Service
P.O. Box 2924
Alice Springs NT 0871, Australia

Radio Australia/ABC
(see Radio Australia address)

Radio Rum Jungle/ABC
Top End Aboriginal Bush Broadcasting Association
Shop 29 Rapid Creek Shopping Centre
Millner NT 0810, Australia

Guam

(Good, 1-2 U.S. mint stamps, souvenirs available)
Adventist World Radio
AWR Headquarters
12501 Old Pike
Silver Spring, MD 20904-6600 USA

Hawaii (U.S. State)
(Good, 1-2 U.S. mint stamps, souvenirs available)
KWHR
LeSea Broadcasting
P.O. Box 12
South Bend IN, 46624 USA

Kiribati

(Fair, mint stamps, IRCs not accepted)
Radio Kiribati
P.O. Box 78
Bairiki
Tarawa, Republic of Kiribati

New Zealand

(Good, 3 IRCs, souvenirs available)
Radio New Zealand International
P.O. Box 123
Wellington, New Zealand

Northern Mariana Islands (U.S. Commonwealth)

Fair, 2 IRCs, souvenirs available)
Far East Broadcasting Company/KFBS Saipan
P.O. Box 209
Saipan, Mariana Islands MP 96950 USA

Voice of America relay
(see Voice of America address)

Palau

(Good, 1-2 IRCs, souvenirs available)
KHBN/Voice of Hope
P.O. Box 66
Koror
Palau 96940, Pacific Islands

Papua New Guinea

(Irregular-fair, 2 IRCs or mint stamps)
(non technical)
National Broadcasting Corporation
P.O. Box 1359
Boroko, Papua New Guinea

Radio Bougainville
(when active)
P.O. Box 35
Buka
North Solomons Province, Papua New Guinea

Radio Central
(when active)
P.O. Box 1359
Boroko, Papua New Guinea

Radio Eastern Highlands
(when active)
P.O. Box 311
Goroka
Eastern Highlands Province, Papua New Guinea

Radio East Britain
(when active)
P.O. Box 393
Rabaul
Eastern New Britain Province, Papua New Guinea

Radio East Sepik
P.O. Box 65
Wewak
Eastern Sepik Province, Papua New Guinea

Radio Enga
(when active)
P.O. Box 300
Wabag
Enga Province, Papua New Guinea

Radio Gulf
(when active)
P.O. Box 36
Kerema
Gulf, Papua New Guinea

Radio Madang
P.O. Box 2138
Madang, Papua New Guinea

Radio Manus
P.O. Box 505
Lorengau
Manus, Papua New Guinea

Radio Milne Bay
(when active)
P.O. Box 111
Alotau
Milne Bay, Papua New Guinea

Radio Morobe
P.O. Box 1262
Lae
Morobe, Papua New Guinea

Radio New Ireland
P.O. Box 140
Kavieng
New Ireland, Papua New Guinea

Radio Northern/Voice of Oro
(when active)
P.O. Box 137
Popondetta
Oro, Papua New Guinea

Radio Sandau
P.O. Box 37
Vanimo
Sandoun Province, Papua New Guinea

Radio Simbu
P.O. Box 228
Kundiawa
Chimbu, Papua New Guinea

Radio Southern Highlands
(when active)
P.O. Box 104
Mendi
Southern Highlands Province
Papua New Guinea

Radio Western
P.O. Box 23
Daru
Western Province, Papua New Guinea

Radio Western Highlands
(when active)
P.O. Box 311
Mount Hagen
Western Highlands Province, Papua New Guinea

Radio West New Britain
P.O. Box 412
Kimbe
West New Britain Province, Papua New Guinea

Solomon Islands
(Fair, 2-3 IRCs or mint stamps)
Solomon Islands Broadcasting Corporation
P.O. Box 654
Honiara, Solomon Islands

Vanuatu (Republic of)
(Irregular - poor, mint stamps)
Radio Vanuatu
Information & Public Relations
Private Mailbag 049
Port Vila, Vanuatu

Q.S.L.

TO GAYLE VAN HORN
of GRENA. LA. USA.

I AM PLEASED TO VERIFY YOUR
RECEPTION OF THIS STATION

AT G.M.T. 0844: 1003 DATE 19 MAR '88
ON 1125, 3945, 7260 KHz

✓
K. J. PAGE.
For RADIO VANUATU
P.O. Box 49,
PORT VILA, VANUATU

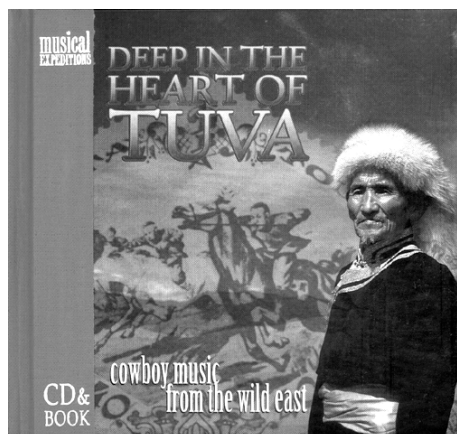
Regional Music from Asia and the Pacific

Using Music to Identify Shortwave Stations



by Bob Tarte

Broadcasters that rely on the Tropical Bands (2,300-6,295 kHz) for shortwave programming generally aren't concerned about how well they're received outside their target area. While the larger international broadcasters are eager to make schedule and frequency changes known, stations that use shortwave primarily for domestic transmissions don't give a hoot if listeners across the ocean are up to spec on their broadcasting plans. Stations come and go with such rapidity, even a monthly source like *Monitoring Times* can't keep up with all the churn. DXers have to rely on their own ears to determine what they're listening to, and knowledge of the music of a region can often provide a solid clue.



In the February 2000 issue, I did a quick survey of Latin America, Caribbean, and African music. This time the idea is a basic overview of Asian and Pacific genres that you might run into when tuning the Tropi-

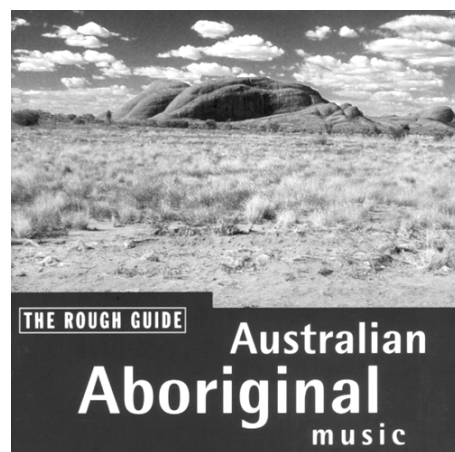
cal Bands and Medium Wave. As before, I'll cite CDs currently in print that will not only give you the lowdown on what's up with world music, but also provide darned good listening. If you're still waiting for your callback from *Who Wants to Be a Millionaire?*, and your pockets aren't particularly deep, go to online CD sellers like amazon.com and hear free RealAudio sound samples of the discs listed here.

Afghanistan

Don't strain your ears for pop or folk music on Taliban-operated shortwave broadcasts from Afghanistan. A muezzin chanting verses from the Koran is the only form of musical expression allowed by the ultra-fundamentalist Islamic ruling party. Should the extra-governmental stations in the North allow traditional music to slip through, you may hear lute instrumental or the lush *ghazal* love songs originally imported from Persia by way of India. These show up on *Afghanistan: A Journey to an Unknown Musical World* (World Network), while selections from the seemingly endless variations of Afghani lutes show up on *Aziz Herawi: Master of the Afghani Lutes* (Arhoolie).

Australia

The Northern Territory Shortwave Service of the Australian Broadcasting Corporation collaborates with the Central Australian Aboriginal Media Association (CAAMA) to provide broadcasts in English



and Aboriginal languages on the Tropical Bands. While Aboriginal traditional music isn't used as entertainment but is keyed to social and religious events, you might still hear this ancient music. Aboriginal songs are characterized by droning melodies from a solo male vocalist often accompanied by the "click" percussion of hardwood clapsticks – along with the throaty buzz of the didgeridu. Thanks to the superb recording quality and intense performances, *Bunggridj-bunggridj: Wangga Songs of Northern Australia* (Smithsonian Folkways) is an exceptional CD by an Aboriginal songman.

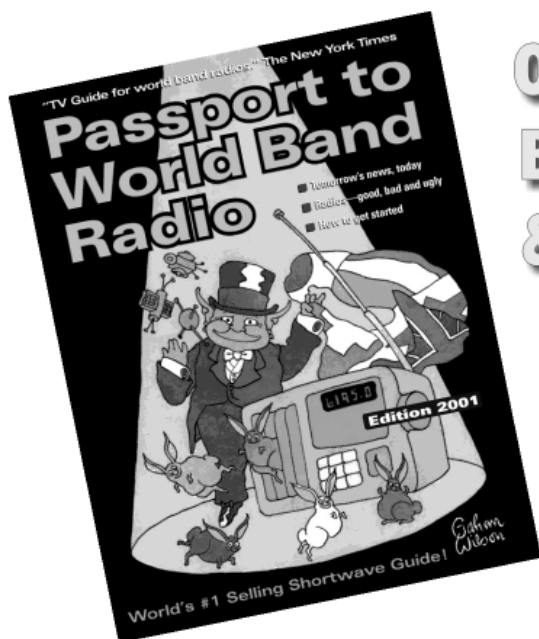
The Aboriginals have been making inroads into Australian pop music, so count on CAAMA for Ozzie country music transformed by local languages and soulful vocals. *Rough Guide to Australian Aboriginal Music* (World Music Network) includes everything from folkie singer-songwriter ballads to forays into electronic dance mu-

They're coming...

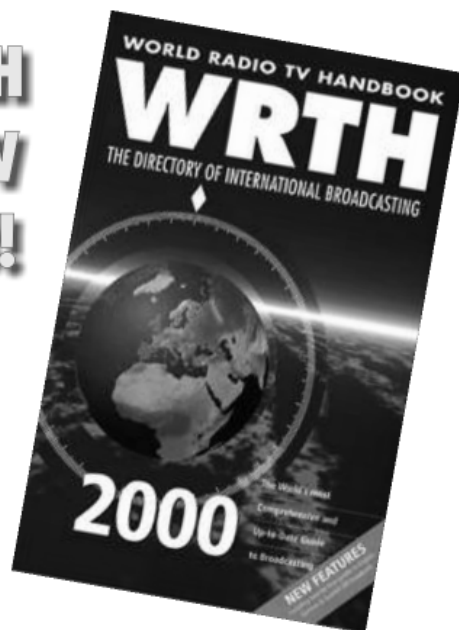
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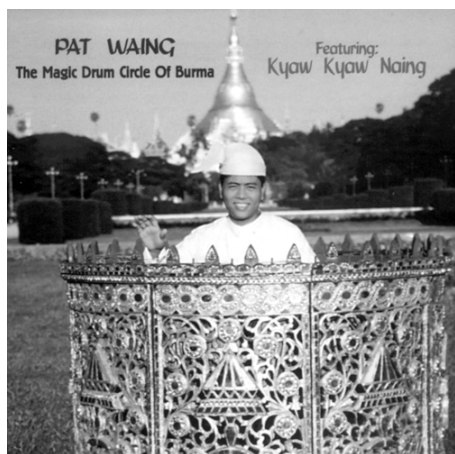
800-438-8155

828-837-9200; FAX 828-837-2216 7540 Highway 64 West, Brasstown, NC 28902 email: order@grove-ent.com

sic. Traditional songs are also on board, so this is a handy one-disc sweep of the arm.

Burma (aka Myanmar)

Think you know what piano music sounds like? Wait until you hear *sandaya*, in which the western baby grand emits unfamiliar note trills and chord splashes as it emulates Burmese harp or mallet instruments. The piano was brought to Burma in the late 1800s, and its adaptation to court music styles and subsequent modernization is the subject of *Sandaya: The Spellbinding Piano of Burma* (Shanachie Records).



The principal ethnic instrument of Burma, however, is the tuned drum circle combining fast melodic riffs and mindboggling percussion. *Pat Waing—The Magic Drum Circle of Burma* on Shanachie showcases Kyaw Kyaw Naing coaxing great virtuosity from the center of his assemblage of 21 tuned drums. Songs where he's accompanied by vernacular oboe resemble Frank Zappa-esque jazz excursions, though the music is traditional.

Cambodia

Listen for a complex orchestra of percussive rhythms in the classical music of Cambodia. Layers of xylophones, cymbals, gongs, and drums cavort to the lead of a *sralai thomm* quadruple-reed vernacular oboe and contrasting melancholy vocals on *Echoes from the Palace, Court Music of Cambodia* (Music of the World).

China

With its solemn operatic voices, instantly-recognizable Chinese classical music is a good tip-off you've landed on a regional Chinese shortwave outlet. Another is music featuring the *erhu*, a high-pitched

bowed lute with the bow-strings held captive behind the two *erhu* strings. Though played like a violin, the instrument's quivering playing style, bright high notes, and a suggestion of "buzzing" overtones give it a decidedly non-Western quality.



Probably the second most widely known Chinese instrument is the *yang-qin* hammer dulcimer, sounding like a cross between a piano and a harp. The *yang-qin* appears in duet with the *erhu* on *String Glamour* (Wind Records).

Chinese folk music has been around so long that it's been codified and fussily arranged in ways foreign to the folk music of most countries. There's little ragged or spontaneous about it, and many treatments are long on sentimentality, as you'll discover when exploring the Ellipsis Arts label's three-disc set of the traditional music of China, *Time to Listen*, which includes vocal and instrumental songs from China's 27 provinces plus Tibet.

Fiji and Pacific Islands

Unison singing, strummed ukulele or guitar rhythms, wood percussion instruments, and an upbeat ambiance are a giveaway you've stumbled across the traditional music of Fiji or other Polynesian Pacific islands. Fijian music has much in common with Hawaiian folk songs and strongly influenced Hawaiian pop back in the 1920s via steel guitar legend Sol Hoopi and others. The Allegro Music import *Colors of the World: Fiji* contains a nice sample of Fijian roots music.

Conversely, *Island Roots* (Quiet Storm), an anthology featuring Na'Auao, Justin, Kolea, and other local celebs serves up generic pop music with Hawaiian and Caribbean accents. Pacific stations on Medium Wave will also feature home-grown rockers like the Fiji Mariners, whose Mercury Records CD *Fiji* proves that classic heavy

metal still hangs on. Except for French Polynesia, some island songs sport English-language lyrics.

French Polynesia

You'll probably only encounter the well-known "war drums" of the Pacific as bumper music on Pacific Island stations, as heard on the Crescendo-label anthology *Drums Of Bora Bora Of Tahiti*. Pop from French Polynesia follows the mold of Fijian music (see above), though with occasional French-language lyrics.

The most astonishing songs from Tahiti and outlying islands are a hybrid of traditional vocal music and hymns taught by missionaries. *Rapa Iti* (Shanachie) by The Tahitian Choir shows off harmony-laden, large ensemble performances of church songs with sudden downward plummets in tone by the female singers, as if a mischievous engineer had applied thumb to take-up reel during the final tape mastering.

India, Pakistan, Bangladesh

Anyone old enough to have survived the 1960s will recognize the sitar as the lead instrument in Indian classical music ragas. Flute, voice, violin, mandolin, and even Hawaiian guitar can also play the central role in a raga. Specific ragas are keyed to different hours of the day – though they are actually performed at any time – and are characterized by improvisations around a basic melody or mode.

Backing the lead instrument are a pair of tabla drums capable of playing a wide range of percussive tones plus a drone string instrument such as the *tamboura*. While a single raga can stretch out to an hour or longer, shorter excerpts are usually aired on All India Radio outlets. The 74 most widely performed ragas are reduced to gem-like miniatures in the four-CD set, *The Raga Guide*, packaged inside a 184-page book with analytical and historical information on each raga.

In addition to classical music, there's also a huge range of folk styles including Sopera "snake charmer" flute songs, dramatic Rajasthani love song vocal music derived from Persian *ghazals*, and percussive-crazy gypsy music (the gypsies of the world are said to have originally come from India). But it's *filmi* that sets the subcontinent on fire. These songs from Bombay's "Bollywood" films manage to shoehorn more styles of music into a three-minute song than most composers fit into a suite. Bits of Indian and European classical mu-

sic, American pop, jazz, mariachi, country music, rap, and commercial jingles all fit easily with room to spare for bodice-ripping lead vocals. The three-volume GlobeStyle Records set, *Golden Voices from the Silver Screen*, captures classic *filmi* at its excessive best. Modern microchip-based *filmi* is exhibited on *Asia Classics 1: Dance Raja Dance* on David Byrne's Luaka Bop label.

Another genre you're likely to hear, especially on Pakistani outlets, is *qawwali*, the devotional music of the mystics of Islam known as Sufis. Lusty as African-American gospel songs, *qawwali* features interlocking vocal parts plus an octave-spanning lead singer like the late Nusrat Fateh Ali Khan, whose *The Last Prophet* on Peter Gabriel's RealWorld label is highly recommended. The goal of *qawwali* is to induce ecstasy in both performers and audience, and with its driving blend of fast percussion, burbling harmonia lines, rousing male voices, and extended song lengths, illumination feels close at hand.

Indonesia

On Radio Republik Indonesia, you may hear *dangdut*, the Javanese rock genre that borrows elements from Indian film music including the tabla drums whose "dong-doot" tones gave *dangdut* its name. But the best known Indonesian music is made by the gamelan "bronze orchestra" of metallophones and gongs as heard in the movie *The Year of Living Dangerously*. During Ramadan, RRI stations may extend their broadcasting hours featuring small ensemble *wayang kulit* gamelan accompaniment for shadow puppet plays that show off energetic xylophone interplay, haunting female vocals, and male narrative singing.



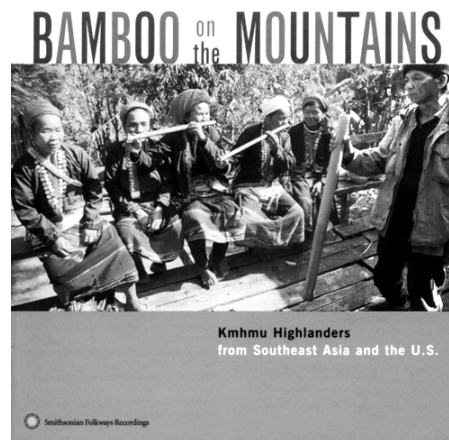
But, the diversity of what you might hear on regional RRI outlets is as astonishing as the 20-volume *Music of Indonesia* CD se-

ries on the Smithsonian Folkways label. Everything from fuzz-guitar *dangdut* to the five-tone vocal music of the Hoho people is presented here, but for *wayang kulit* look to Rounder Records' *Shadow Music of Java*.

Laos, Thailand, Vietnam

The sound of these three countries is the sound of bamboo. Listen for the *sngkul* mouth organ, a multi-tube ancestor of the accordion, played solo or accompanying narrative songs, the *hur tlaa rung* blowing tube which females sing and hum through, along with various flutes, zithers, reedpipes, jaw harps, and percussive instruments, all made from bamboo. Pop, rock, and reggae with an Indochinese accent are possibilities.

Court music of Laos and Thailand includes bamboo marimbas, stringed instruments, and gongs playing complex songs which, like Chinese music, often depict scenes in nature. *Royal Court Music of Thailand* (Smithsonian Folkways) and *Music of Laos* (Rounder) provide nice overviews.



Moonlight in Vietnam (Henry Street/Rounder) by Khac Chi Ensemble boasts an amazing collection of local instruments, including the traditional Vietnamese version of Joe Walsh's voice-bag guitar gimmick, the *ko ni* stick fiddle, with resonating disc held in the player's mouth.

Mongolia

The nomadic horsemen of Mongolia make music that reflects their rugged environment using percussive instruments made from bull testicles and the plaintive-sounding one-string *igil* fiddle. But Mongolians are best known for a vocalization style called throat singing. Accomplished singers produce a series of harmonic overtones, effectively singing a chord rather than a single note. The best examples on disc of

this remarkable feat come from Tuva, a small former Soviet republic on the Mongolia border. *Deep in the Heart of Tuva*, a CD/book combo from Ellipsis Arts, contains everything from the eerie, whistling *sygyt* to the Popeye-voiced *kargyraa*.

Tuva: Among the Spirits (Smithsonian Folkways) demonstrates how this exotic genre mimics animal and other natural sounds. You might also hear one of the new breed of throat singing ensembles such as Yat-Kha, who combine traditional styles with amplified instruments on the strange and compelling *Dalai Beldiri* (Wicklow Records).

Papua New Guinea

As in the Solomon Islands, reggae is popular on both halves of the island of New Guinea (Papua New Guinea and Irian Jaya), so listen for either Jamaican music or local variants, plus any western pop that's in vogue. A now out-of-print 1989 Mercury Records anthology of Pacific music called *Musical Mariner* by Australian ethnomusicologist and composer David Fanshawe included homegrown Papuan rock centered around an amplified wooden marimba, but I don't know if this style is still current. Music from the interior is centered around voice and drum and is distinguished by simple, chanted melodies and repetitive rhythms. Island church music follows the model taught by missionaries throughout the Pacific where large choirs perform slow, unison singing without instrumental accompaniment. Examples abound on *Music of Indonesia 10: Music of Biak, Irian Jaya* (Smithsonian Folkways).

Solomon Islands

I felt confident I'd bagged the Solomons on 5,020 kHz last summer when the DJ played three reggae songs in a row, including one in pidgin English. Radio Happy Isles hosts a cosmopolitan selection of American and European pop, much of it pretty current, though I thought I noticed an appropriate emphasis on "happy" sounding songs. Listen also for bits of Australian and Pacific Island material.

About the author:

Bob Tarte writes a world music column for the Los-Angeles-based music magazine, *The Beat*. Over 600 of his world music reviews are available at www.technobeat.com.

Record that music style, station call or interval signal, and with time there's almost nothing you can't decode or identify, even if it's in a foreign language or Morse code. But forget that tape recorder!

DX Lifesaver: the MiniDisc Recorder

by Bob Tarte

It's seven minutes past the hour, and still no station ID. You've been glued to that foreign language shortwave station for almost an hour, but you don't have a clue what you're listening to. Finally, the long-awaited announcement comes... just as you take a long-deserved drink of water. Too bad you had to swallow and miss it!

If your tape recorder was running, the gods have granted you a reprieve. But if the station you were monitoring was weak, the extra background noise introduced by a cassette tape could push that station identification deeper into the murk. Fortunately, you were using a MiniDisc recorder, so your recording will sound exactly like the original. Plus you can put a track marker at the beginning and end of the ID to access it instantly, then loop it to automatically repeat that ID until you've identified your mystery broadcaster.

A Dismal Marketing Failure

MiniDisc recorders have enjoyed deserved success since their debut in Japan but fell flat in the U.S. when introduced in the mid-'90s. Chalk up a big part of the medium's failure to inept marketing, though timing was another problem. The MiniDisc format hit just after the spectacular nose dive of pricey DAT (Digital Audio Tape) cassette recorders, whose availability was quashed by nervous record labels afraid of digital piracy.

"Not another stupid format," I grumbled, when I saw the first magazine ads for Sony MiniDisc players. I didn't see the point of this new medium, and I was holding out for recordable CDs, which were then still years away.

As it turns out, MiniDisc recording offers huge advantages over analog cassette recording, including extended recording time and random access to tracks. It's also far more flexible and simpler to use than a CD recorder and satisfies the cheapskate soul of DXers everywhere with a price tag of under \$200 for a stunningly good machine.

A MiniDisc recorder has been a lifesaver for me in rescuing program details from middling reception. Solomon Islands BC on 5020 kHz may be easy pickings for West Coasters, but here in the Great Lakes it can be a challenge. I had a solid logging recently (see the accompanying feature article), but couldn't decipher song titles or commercials due mainly to a mismatch between Michiganian and Melanesian English. Repeated MiniDisc listening of my crystal-clear



DX Lifesaver - the Sony MZ-R37 MiniDisc Recorder

recording did the trick, and I got my QSL.

Netting Rare DX

The big feature that drove me to the MiniDisc was the extended recording time. As high frequency propagation conditions improved with the sunspot cycle peak, I decided to troll for rare countries by taping amateur radio nets for playback later – like the Bill Bennett Family Hour DX Net on 14,245 kHz at 1400 UTC. With my cassette recorder I could tape only an hour's worth of chat. A MiniDisc, however, holds 74 minutes in stereo mode or a full 149 minutes in mono with no loss in sound quality. A "search" feature like the one on CD players lets you scan the audio at about double speed. Some MiniDisc recorders automatically stamp the time and date on each recording, simplifying logging.

The long recording time is also a benefit if you tune in a faint tropical band station just before bedtime. Scan your disc next morning. Somewhere in the course of the two-and-a-half-hour recording time, the signal may have risen to a readable level.

The Outboard Timer Blues

I wasn't very bright ordering my first



Sony MZ-R37 and Sharp MD-R2

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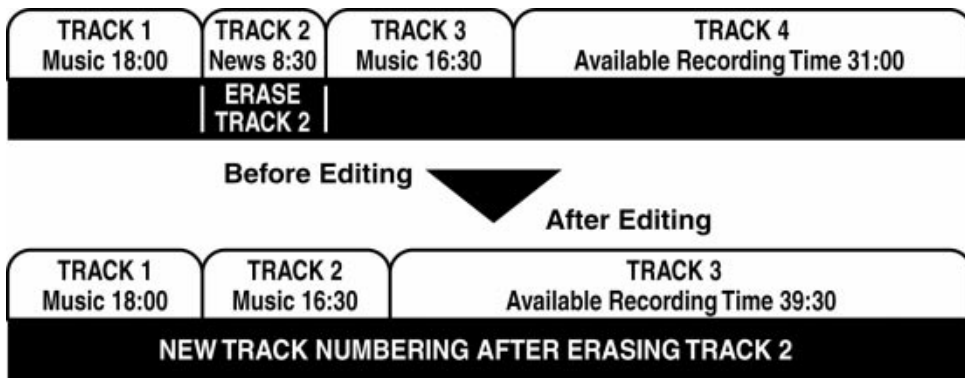
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MiniDisc recorder, a tiny Sony MZ-R37. I planned plugging it into the multi-event Radio Shack timer that I used with my cassette recorder. I'd set the machine on "record," then let the timer turn the juice on and off as needed. Unfortunately, a MiniDisc player won't work with an outboard timer. It has to write a table-of-contents to save your recording before you kill the power. So I bought a Sharp MD-R2 deck with an on-board timer. Though the timer is only single-event, powerful editing features let you be a little sloppy with start-stop times.

Say you've set your timer to record *rembetika* music from the Voice of Greece, but you don't want the Greek language news at the top of the hour. A multi-event time would let you stop and start taping to skip the news. The MiniDisc method is cleaner (see illustration). Record the whole program chunk, news and all. During playback, create a track marker (call it Track 2) just before the news, then another track marker (Track 3) when the music starts again. In edit mode, erase Track 2. The news disappears, seamlessly combining your two sets of music. The 8:30 hole where the Greek news had been is now effectively added to "the end" of the MiniDisc as available recording time, thanks to RAM (random access memory) similar to your computer hard drive.

Mucho Mini Features

Here are more great MiniDisc features and suggestions for using them.



One great advantage of digital editing

Extreme portability. My Sony MZ-R37 is a little larger than a pack of cigarettes, inviting lots of portable use. I plug it into my Drake R-8 to record DX, then connect it to my living room hi-fi and twiddle with the equalizer to clarify difficult recordings. I also hook it up to my C-band satellite receiver to record the Saturday morning CBC Radio One line-up on Anik 2.

Better-than-CD sound quality. MiniDisc recorders have a 20-bit sampling rate compared to the 16-bit resolution of today's CD players, so you'll be amazed at how good your recordings sound.

Digital inputs and outputs. You can input and/or output your recordings as digital data streams that do not degenerate with rerecording. A tenth-generation digital copy of "World of Radio" will sound identical to the analog

original. Using two MiniDisc machines, you could make a disc containing just the station IDs or interval signals of your best DX catches.

Programmability. Play back your tracks in any order you want, repeating them as desired, just like on a CD player. This is nice when transferring select tracks to another MiniDisc machine, cassette recorder, or CD burner.

Editing Options. The tracks you've recorded can each be erased, divided, combined, and moved to create a maximum of 255 tracks. Entire discs can be erased with a couple of key-strokes.

Disc and Track Naming. Give your disc a name, like "Peruvian DX," and the title appears on the display window when you pop it in the machine or hit "stop." You can also add title and other information to each track, such as "R. Andahuaylas, 4/17/00, 1045 UTC" – the text will scroll as the track begins to play. Each MiniDisc holds up 1700 text characters and/or up to 100 characters per track.

Sound Synchro Recording. In sound synchro mode, recording starts as soon as an audio signal is present. When the signal stops, the recorder shifts to pause for up to five minutes. Experimenting with a MiniDisc recorder, your shortwave receiver, and the squelch control could yield interesting results. It works well when recording RealAudio files off the internet. Interruptions that may occur while you're receiving a file in real-time due to net congestion completely disappear during playback.

Cheap Hardware. The full-function Sony MZ-R37 is just under \$200 and includes rechargeable batteries, AC adapter, optical digital cable, wired remote, and headset. It's probably all you need, unless you want a unit with on-board timer. In that case, plan on spending an additional \$100. More expensive machines include features such as time/date stamping and track fade-out.

Cheap media. Bought in packs of 10, MiniDiscs cost under \$2 each for almost 2.5 hours of mono mode recording per disc. Buy lots and archive everything.



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"The new radio revolution will be monitored not by us, but by our appliances."

Bluetooth: Welcome to the New World of Wireless

By Jesse A. Finkelstein

Is Bluetooth a (1) 10th century Viking King, or (2) a bold wireless radio initiative that will soon become a part of everyday life? If you selected (1), you are correct. Harald Bluetooth was a 10th century Danish king. But if you chose (2), you are also correct.

The New Wireless World

Bluetooth is an exciting collaboration involving over 1300 companies and developers. The goal is to create a single, common, radio interface that will work with a wide variety of devices. The fundamental Bluetooth building block is a small, low-powered radio chip that will "talk" seamlessly with other Bluetooth enabled devices. Imagine the following:

- You walk into your office, and your Personal Digital Assistant (e.g. Palm Pilot) automatically synchronizes with your desktop PC, updating files, e-mails and schedules.

- In a meeting, you project your PDA or laptop notes onto a large screen, without any wires. You share notes or electronic "business cards" with others at the meeting without any interconnection.

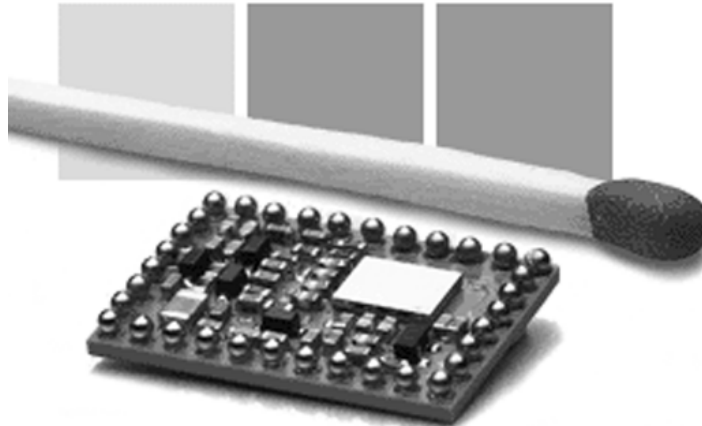
- At home, the door locks open for you, lights come on, and the thermostat is adjusted as you enter. Your PDA is automatically synchronized with other family members' updated schedules. By the way, forget computer cables altogether...your PC, printer, and scanner are linked by Bluetooth enabled chips instead.

- Your scanner, PC and television will communicate with one another, allowing you to project your computer spectrum scans onto the television between commercials.

- Driving into a park, a map pops up on your electronic display, as well as a schedule of activities and a personal tour guide.

- Your telephone is both personal and smart...at home it operates as a cordless landline unit, as you leave home range it automatically switches to digital cellular, if you call a family member within a given range, it acts as a walkie talkie.

- Catching a plane is now a breeze: your e-ticket and seat assignment are communicated as you



Ericsson's Bluetooth-compatible radio transceiver is a 1/2-inch-square module operating in the 2.4 GHz band.

walk down the ramp. Waiting in an airport, you sit in the general proximity of Bluetooth enabled internet ports, which allow you to access the internet, or place "free" internet calls through an airline server.

- You walk into a first run movie, avoiding the line, and taking your reserved and assigned seat, which has been reserved, paid for and communicated as you walk into the building.

These are just some of the initial applications that will soon be implemented.

How Does It Work?

Bluetooth communications chips are designed to be small, universal and inexpensive. Importantly, spread spectrum technology (direct sequence and frequency hopping) and secure software codes ensure that only devices identified and enabled by the specific user will respond to one another, without accidentally responding to instructions from other user's devices.

Equally critical is affordability: the Bluetooth enabling module will cost roughly \$15 to \$20 when it is first introduced. Observers suggest that, like most electronic innovations, the price will quickly fall. Based on anticipated volume of production and universality of the product's introduction, the per module cost will likely be around \$5 by 2002. Although Bluetooth enabling chips will be incorporated in many new products, there is likely to be an initial market in "add-on" devices, permitting pre-Bluetooth products to be enabled for communication with other Bluetooth products.

While the chips will be small (0.5 inches square), they will support the transmission of substantial amounts of data on a real-time basis. Both voice and data communications are possible, with data speeds up to 721 kilobytes per second.

The Bluetooth system operates in the 2.4 GHz Industrial Scientific Medicine band. The transmissions hop through 79 channels, at a speed of 1600 hops per second. In the United States, Europe and most countries, universal compatible devices can operate between 2.400 and 2.4835 GHz. Spain (2.445-2.475 GHz) and France (2.4465-2.4835 GHz) have slightly different ranges, but special frequency hopping al-

gorithms have been specified for local use in these countries. Although locally restricted devices would not necessarily be compatible with full band devices, the consortium is working to achieve universal harmonization of the frequency ranges.

Powered by 2.7 volt power sources, Bluetooth devices will operate within three distinct power classes: Class One (100mW, with a minimum output of 1mW); Class Two (2.5mW, with a minimum output of .25mW) and Class Three (1mW output). Class One power devices will all include an automatic power control, which adjusts to minimize interference and optimize power consumption based upon the distance of other devices. The lowest power levels work well with devices in a room, although the "line of sight" requirements of many current optical remotes will no longer restrict placement of "connected" devices. Average transmission ranges will be around 40 feet. The highest power levels will cover a house, or work best while you are on the move. In all respects, the specifications of Bluetooth are intended to comply with FCC parts 15.247, 15.249, 1.205 and 15.209, ETSI 300 328 in Europe, and RCR STD-33 in Japan.

How will this all work when we are surrounded by Bluetooth enabled devices? Bluetooth has been specifically designed to op-

erate with multiple groups of users in the same location. Up to 8 devices can be linked to make up a "piconet," and up to ten piconets can operate without interference in the same coverage area. Bluetooth effectively operates as a continuously updateable, user defined, secure local wireless network.

What Next?

With the financial commitment and support of such international powerhouses as IBM, Lucent, Toshiba, Motorola, Ericsson, Nokia Microsoft and 3Com, Bluetooth assuredly will become a workable and universal standard. Importantly, the Bluetooth standards are publicly available, and are royalty and license free, thereby allowing worldwide adoption without the usual cost and risk to potential new market entrants of intellectual property protection. Just as the Internet has changed most areas of commerce and activity, new Bluetooth applications will become apparent after the first wave of devices are successfully integrated into the marketplace.

Perhaps the most exciting applications will combine the local area transmissions of Bluetooth enabled devices with the power of the Internet. For example, one company, World Wireless Communications, already proposes to

Table of operating frequency bands.

source: Bluetooth specifications, version 1.0B

| Geographic Region | Regulatory Frequency Range | Nominal RF Channels |
|-------------------|----------------------------|--------------------------|
| USA, Europe | 2.400-2.4835 GHz | f=2402+k MHz, k=0,...,78 |
| Spain | 2.445-2.475 GHz | f=2449+k MHz, k=0,...,22 |
| France | 2.4465-2.4835 GHz | f=2454+k MHz, k=0,...,22 |

Table of Bluetooth power classes.

source: Bluetooth specifications, version 1.0B

| Power Class | Maximum Output Power | Minimum Output Power |
|-------------|----------------------|----------------------|
| One | 100 mW (20 dBm) | 1 mW (0 dBm) |
| Two | 2.5 mW (4 dBm) | 0.25 mW (-6 dBm) |
| Three | 1 mW (0 dBm) | N/A |

combine these concepts, giving each device enabled with Bluetooth-type technology its own World Wide Web URL. Instead of worrying about whether you turned off the coffee maker, you will be able to check (and control) such mundane devices simply by using a web browser on any Internet-connected PC. The new radio revolution will be monitored not by us, but by our appliances.

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Those Ham Radio Special Event Stations

By Douglas A. Blakeslee, N1RM

Most listeners' radio shacks are festooned with QSL cards. But, if you collect "wallpaper," nothing beats the ham radio special event stations for quantity and quality. Most of these operations give out certificates, suitable for framing if desired. If you have a small shack, you may have to use the ceiling to display 'em all.

A special event station can be established to publicize or to commemorate almost anything. In many ways they are a window on Americana. They can be serious or just for fun. On the serious side you can have a memorial to the *U.S.S. Arizona* and the celebration of our nation's birthday. On the other end of the spectrum, you can monitor "Whiskey Week" and "Toad Suck Days." As they say, "only in America!"

While the primary task of a special event station is to contact as many ham stations as they can, most also will answer listener reports. After all, most amateur radio operators started out as shortwave monitors. Many still enjoy the hobby in addition to their ham activities.

Most event stations appear on weekends, usually during daylight hours. The prime frequencies are 14250 and 21350 kHz, upper side-band (USB) plus or minus 20 kHz. Two ham radio publications, *QST* and *CQ*, list upcoming special event stations, along with addresses where confirmation cards can be sent. When a station is noted, it is best to record the details of several contacts. Some stations give out contact numbers, which should be recorded.

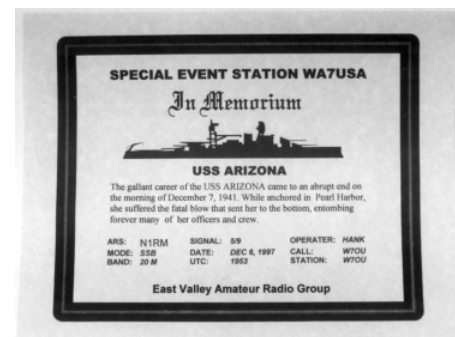
Then, fill out your confirmation card. Use a 10 X 12-inch envelope with a 55-cent stamp

addressed to yourself. Fold the envelope in half and insert your confirmation card. Put these two items into another 10 X 12 envelope and send it off to the event station host. Normal response time is two to three weeks after the event—much better than most shortwave broadcasters.

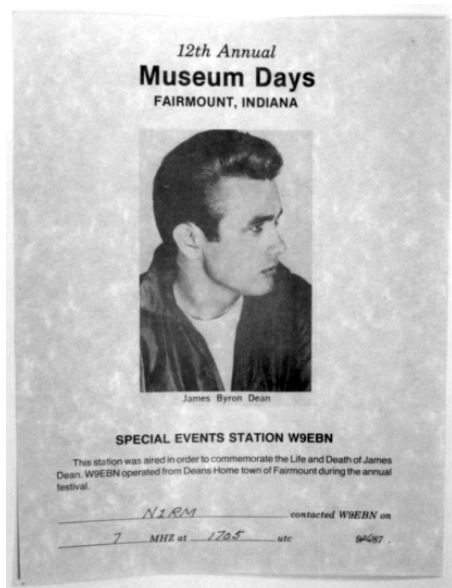
So, collect your own bit of Americana.



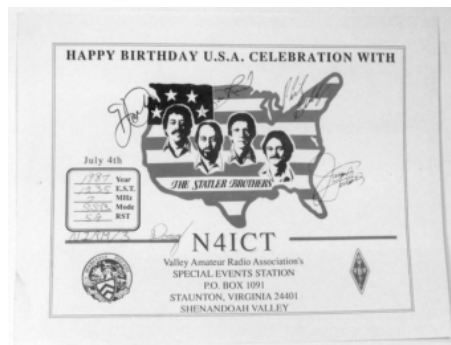
The "Tin Lizzie" certificate is from the Ford Amateur Radio League in Dearborn, Michigan. This writer had the honor of being invited to visit with this group and to give a presentation about antenna techniques.



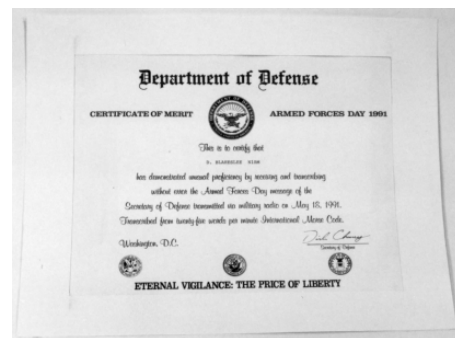
Some special event stations commemorate events. This certificate is in memoriam of the *U.S.S. Arizona*, which is at the bottom of Pearl Harbor, Hawaii. This event was sponsored by the East Valley Amateur Radio Group in Arizona.



James Dean, an actor who died very young, was remembered by a group from his home town of Fairmont, Indiana, operating as W9EBN.



For several years the Statler Brothers performed on July 4th from Staunton, Virginia. This certificate is a collector's item, as each of the brothers personally signed it.



One of the granddads of special events is the annual Armed Forces Day message from the Secretary of Defense sent in Morse code and via radio teletype. It is broadcast from the Pentagon and from several other military bases utilizing Military Affiliate Radio System (MARS) frequencies which are near popular ham-radio bands.

GLOSSARY

A Glossary of radio related terms used in *Monitoring Times*. (See www.grove-ent.com/mtglossary.html for a much more comprehensive list.)

THE RADIO SPECTRUM

ULF - Ultra Low Frequency (3-30 Hz)
 ELF - Extremely Low Frequency (30-300 Hz)
 VF - Voice Frequencies (300 Hz-3 kHz)
 VLF - Very Low Frequency (3-30 kHz)
 LF - Low Frequency (30-300 kHz)
 MF - Medium Frequency (300 kHz-3 MHz)
 HF - High Frequency (3-30 MHz)
 VHF - Very High Frequency (30-300 MHz)
 UHF - Ultra High Frequency (300 MHz-3 GHz)
 SHF - Super High Frequency (3-30 GHz)
 EHF - Extremely High Frequency (30 GHz and above)

// - Indicates a Parallel Frequency

μ F - Microfarad

μ H - MicroHenry

AC/ac - Alternating Current

AGC - Automatic Gain Control

AM - Amplitude Modulation

ARRL - American Radio Relay League

BCB - Broadcast Band (530-1705 kHz AM)

Bd - Baud

BFO - Beat Frequency Oscillator

BNC - Coax connector commonly used with VHF/UHF equipment

CB - Citizen Band

C-band - 3.7-4.2 GHz

Comm - Communications

CQ - General call to all stations

CTCSS - Continuous Tone Controlled Squelch System

CW - Continuous Wave (Morse code)

DAB - Digital Audio Broadcast

dB - Decibel; dBi- decibels over isotropic

DBS - Direct Broadcast Satellite

DC/dc - Direct Current

de - Morse code prosign meaning "from"

DSP - Digital Signal Processing

DTMF - Dual Tone Multi Frequency

DTRS - Digital Trunk Radio System

DX - Distant Station Reception

DXer - A person who engages in the hobby of distant radio/television reception

DXing - The hobby of listening to distant radio or television signals

DXpeditions - DX Expeditions (trips to the boonies by radio listeners)

ECPA - Electronic Communications Privacy Act

ECSS - Exalted Carrier Selectable Sideband

E-skip - Sporadic E-layer ionospheric propagation

FCC - Federal Communications Commission

FD - Fire Department

FM - Frequency Modulation

Freq - Frequency

FRS - Family Radio Service

GHFS - Global High Frequency System

GHz - Gigahertz

GMDSS - Global Maritime Distress and Safety System

GMRS - General Mobile Radio Service

GMT - Greenwich Mean Time (replaced in most applications by UTC)

GPS - Global Positioning Satellites

GSM - Global System for Mobiles (900 MHz)

HT - Handi Talkie/Handheld Transceiver

Hz - Hertz

ID - Identification

IF - Intermediate Frequency

IRC - International Reply Coupon

ISB - Independent Sideband

kHz - Kilohertz

km - Kilometer

Ku-band - 11.7-12.2 GHz (plus 12.2-12.7 GHz in North America)

kW - Kilowatt

LCD - Liquid Crystal Display

LED - Light Emitting Diode

LNA - Low Noise Amplifier

LNB - Low Noise Block Downconverter

LNBf - Low Noise Block Downconverter Feedhorns

LSB - Lower Sideband

LT - Local time

LW - Longwave (150-300 kHz)

mb/MB - meter band/Megabyte

MDT - Mobile Data Terminal

MF - Medium Frequency

MHz - Megahertz

ms - milliseconds

MT - Monitoring Times

MUF - Maximum Usable Frequency

mW - Milliwatt

MW - Medium Wave (typically 530-1710 kHz)

MW - Megawatts

NCS - National Communications System/Net Control Station

NDB - Non-Directional Beacon

NFM - Narrowband Frequency Modulation

NiCd - Nickel Cadmium Battery

NiMH - Nickel Metal Hydride battery

No Joy - Station did not answer call

NWR-SAME - National Weather Radio Specific Area Message Encoding

Ops - Operations

Packet - Amateur radio error correcting mode

PC - Personal Computer/Printed Circuit

PCS - Personal Communication System/Satellite

PD - Police Department/Primary Data

PFC - Prepared Form Card

PL - Private Line

Q - Performance rating regarding selectivity or bandwidth

QRM - Interference from another station

QRN - Interference from natural or man-made sources

QRP - Low power operation

QSL - A card or letter confirming reception of a radio station

QSO - Communications between two or more stations

QTH - Location

RDF - Radio Direction Finding

RF - Radio Frequency

Rptr - Repeater

RTTY - Radioteletype

SASE - Self Addressed Stamped Envelope

S-band - Microwave frequencies above UHF

SCA - Subsidiary Carrier Authorization (now known as SCS)

SCPC - Single Channel Per Carrier

SCS - Subsidiary Carrier Service

SELCAL - Selective Calling

Sesqui - A "Hauserism" meaning one and one-half

SINAD - Signal to noise and distortion ratio

SINPO - A code system used by radio hobbyists to indicate how well a station was received: S=Strength, I=Interference, N=Noise, P=Propagation, O=Overall (sometimes shortened to SIO)

SITOR-A(B) - Simplex teleprinting over radio system, mode A (B)

S-Meter - Signal Strength Meter

SMR - Specialized Mobile Radio

S/N Ratio - Signal-to-Noise Ratio

SSB - Single Sideband

SSN - Sunspot Number

SW - Shortwave (high frequency - HF)

SWBC - Shortwave Broadcast

SWL - Shortwave Listener

SWR - Standing Wave Ratio

Tac - Tactical

Tent - Tentative

TIS - Traveler Information Service

TVRO - TV Receive Only

Tx - Transmit

UHF - Ultra High Frequency

UKoGBaNI - United Kingdom of Great Britain and Northern Ireland

ULS - Universal License System

Unid - Unidentified

USB - Upper Sideband

UT - Universal Time

UTC - Universal Time Coordinated

Vac/VAC - Volts Alternating Current

Vdc/VDC - Volts Direct Current

VFO - Variable Frequency Oscillator

VOLMET - Aviation Weather Broadcasts (on HF)

VOX - Voice Operated Relay

VSWR - Voltage Standing Wave Ratio

WAM - Wideband Amplitude Modulation

WEFAX - Weather Facsimile

WFM - Wideband Frequency Modulation

wpm - Words Per Minute

WWV - National Bureau of Standards Time Station, Ft. Collins, CO

WWVH - National Bureau of Standards Time Station in Hawaii

Wx - Weather

WXSAT - Weather Satellite

X-band - Expanded AM broadcast band (1610-1700 kHz)

Zulu - Military time zone (same as UTC)

New Beginnings for the Beginner's Corner

As you may have noticed, a couple of us *MT* regulars have swapped seats and taken on new tasks. The Beginner's Corner will be an interesting mix of topics on beginning electronics ranging from scanning, shortwave listening, antenna building, and other items of note, including the satellite TV hobby.

Meanwhile, this column will continue the fine tradition set by the very capable "Uncle Skip" Arey introducing readers to the fundamentals of the radio arts. I hope you'll enjoy the ride with your new guide. Always remember that your input on all *MT* columns counts! If you have a topic you'd like explored or have a question which has kept you up nights, just send it in to me via email or *MT*'s main address, and I'll see what I can do for you.

❖ A Long and Winding Road

As we embark on this new journey I'd like to introduce myself to those of you who may not have been following my Grove Enterprises writing career over the last 12 years. My first article was about Satellite TV DXing, which appeared in the June '88 issue and led immediately to a monthly column in *MT* called "Adventures In the Clarke Belt." In 1994 Bob Grove founded sister publication *Satellite Times* and I was asked to write the *ST Beginner's Column*. That column ran until the demise of the publication. When *ST* folded in September of '98 I was asked to continue to do a satellite column in *MT*, this time called "The Launching Pad."

My interest in radio and electronics started long before my involvement in satellites, however. As a teenager in the mid 1960s, I was given an old tube-fired Motorola table clock/radio. My Mom had just bought a newfangled solid state kitchen radio and was retiring the trusty Motorola.

With its built-in loop antenna, ailing tubes, and minuscule tuning capacitor, I set out to discover the world of broadcast band DXing. What I discovered was that, after the rest of the family had gone to bed and the house grew completely quiet and the ionosphere opened up, I could travel half the North American continent in just minutes ricocheting from Montreal, Canada, to Ciudad Juarez, from Omaha, Nebraska, to Freeport, The Bahamas.

Deftly working the tiny tuning knob of that table radio I could listen to the weather from Chicago and Detroit; down and out R & B from WLAC Nashville, TN; the latest Beatles hit from KAAY, "The Mighty 1090" in Little Rock, AR; and the satin voice of Tom Looney at WBT "From Canada to Cuba" Charlotte, NC. From my location in Central Florida, stations from Cuba and the other Carribean Islands came in

like Tampa locals. It wasn't long before I was sending off for QSL cards and keeping a log. I was hooked

But, I wasn't content to listen. I just had to be on the air myself. So, as a Junior in High School I went to the local AM radio station seeking a job. They said I would need a license, that I would have to go to the Federal Building in Tampa for the 3rd Class Radiotelephone test. I was dismayed but undaunted. Within days of getting my driver's license a letter from the FCC showed up in the mailbox with my 3rd Phone. I practically sprinted to the radio station.

"Very nice," they told me, "but you'll need an audition tape." The station was a daytimer so I made arrangements to be there on a Sunday

after sign-off to make the tape. The announcer on duty was not thrilled with this unpaid overtime task so he slapped a reel on the old Roberts reel-to-reel machine, ripped a five foot strip of copy off the AP machine, turned on the tape and said, "Read." I stumbled through the five minute newscast, butchering the names of foreign leaders and capitals. I left the station uncertain about any future career in radio.

But, as luck would have it, a replacement was needed for the Sunday sign-on shift and if I could be there by 5:15 a.m. on Sunday the job was mine. I stayed at that station for two years, working full time in the last year. I spent 5 years as an announcer on stations in Florida, Georgia, and Alabama as I made my way through school. I played rock, country, jazz, classical and Middle of the Road (MOR as it was called in those days). I mastered the foreign names and places, learned to write and produce news shows, do interviews, and produce commercials. It was a real commercial radio education.

But, it was also in that fateful Junior year in High School that a buddy and I built a Knight Kit Star Roamer shortwave radio. Naturally, after weeks of hard work in assembly it didn't work. However, some quick help from a nearby radio repair shop corrected our many soldering errors and I began DXing the vast shortwave bands. After being confined to the AM band it was like looking up into the wide open skies over Florida. I hardly knew where to begin.

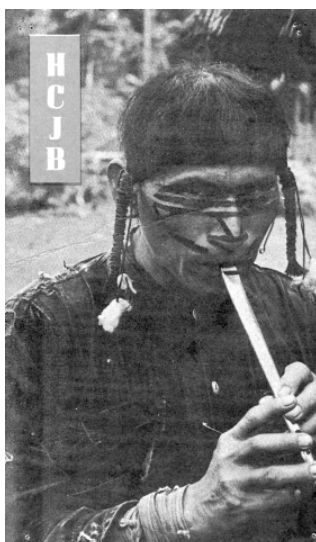
I listened to the big international broadcasters, the old reliable Auntie Beeb; the predictable VOA with its biggest asset, "The VOA Jazz Hour" with Willis Conover; "The Happy Station" from Hilversum, Holland, Radio Nederland; the laughable Radio Moscow with the latest report on the next "Great Leap Forward." It was back to the Post Office for more stamps as the QSL requests were now going out all over the world.

In no time the mailman was bringing not only QSL cards from Europe and Africa but glossy propaganda magazines from China. From Cuba came *Gramma*, the Official Organ of the Central Communist Party of Cuba and I could tell my Dad was getting a little nervous. "Hey," I would say, "I only sent a request for a QSL!" All sorts of artifacts rolled in: a beautiful color reproduction of the bust of Nefertiti from U.A.R. Broadcasting, Cairo; a wonderful wooden flute from HCJB Quito, Ecuador; a QSL card from Radio Vatican showing their antenna in the shape of a cross, among dozens of others.

❖ Fast Forward

Throughout the next two decades technology leap-frogged its way into the '80s and I found myself intrigued with the concept of satellite television. It all started because I was interested in following the Space Shuttle missions which were no longer televised by the networks. I knew that NASA provided a live feed (they still do) from lift-off to landing to the press and that the feed was sent via satellite. I was determined to be able to watch these missions and set out to learn more about this emerging hobby.

In 1984 nothing transmitted on satellite was scrambled, everything was in the clear and, if you had the bucks, you could tune into an amazing array of transmissions. Well, I didn't have the bucks, but I had read enough in the hobby magazines to know I could put together a system myself for about a tenth the retail price. The next several years were spent exploring the Clarke Belt and constantly trying to keep up with home satellite technology. Throughout the years



Tireless SW Broadcaster HCJB sent bamboo pan flutes along with this QSL card 35 years ago.

I've kept *MT* readers up to date on all of the aspects of the hobby through nearly 150 columns and articles on the subject.

Despite the time required to deal with burgeoning satellite technology, I still maintained an interest in radio transmissions in all bands and modes. This was expanded into the world of amateur radio in 1988 when I received my Novice license. A year later I upgraded to General and stayed there until 1995 when I decided to go for the Advanced class. Finally, in June 1999 after several false starts, I made it to Extra Class.

Currently, I operate a Kenwood TS-140S (brand new 12 years ago!), which covers 160-10 meters at 5 to 100 watts output. The receiver in the 140 doubles as my general coverage shortwave receiver and I can assure you I've never had anything this good in my long SWL career. I use an all-band tunerless wire antenna and a three element CushCraft Tri-bander for 20-15- and 10 meters. I also operate a 2 meter FM fixed station using a 4 element CushCraft beam at the house.

For three years I operated 2 meter bicycle mobile. I've operated aeronautical mobile (from a tethered hot air balloon), and HF from one of the highest spots on Virginia's Appalachian Trail using the trusty 140, a wire antenna and a motorcycle battery. For portable SWL I use a Uniden 2021 and for pure nostalgia, in the depths of winter when the listening post can use a little extra heat, I sometimes crank up the vintage 1936 RCA shortwave receiver.



1994 I'm racking up the miles going bicycle mobile, 21 gears no waiting! Note homebrew antenna support structure on back, motorcycle battery power supply under the seat, Alinco 2 meter mobile rig (up to 50 watts out!) and homebrew helmet mounted mike with push-to-talk mounted on the handle bars.

From my car (known as Bluey, the '78 Wonder Celica) I operate 10 meters, using a Uniden 2510 feeding a Hustler 10 meter vertical; 2 meters using a CushCraft mag-mount; and (dare I say it), CB! I use an antenna switch to flip the Hustler from the Uniden to the CB. While 2 meters is useful for motoring nothing beats 10 meters, when the band is open, for old time rag chewing! Ten meter rigs are cheap, antennas small and, when the sunspots are right, you can work the world on the 25 watts these little rigs put out.

❖ Where We're Going

OK, enough about me! What about you? As we start a new era in the Beginner's Corner, drop me a line or send me an email about where you'd like the journey to take us. I don't know where we'll end up but I can tell you this: Over the next year or so we'll cover all the radio bases. I'll help you get started in SWLing, scanning, amateur radio, satellite TV, and everything in between. I'll explore electronic construction projects, antenna projects, and some amazing and very useful electronic projects you'll wonder how you did without. If you never thought of yourself as a Do-It-Yourselfer you'd better take another look in the mirror, because before this is over you'll be doing some great things and having a lot of fun at the same time.

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Bob Grove, W8JHD
bgrove@grove-ent.com

Q. Just got a GE 40-Channel CB Transceiver for the car. What do you recommend for an antenna? (JP, e-mail)

A. Because CB is at 27 MHz, no scanner mobile antenna will work well with it. I'd suggest Radio Shack or other CB outlet; size for size and design for design, CB antennas are pretty much the same. Ideally, a 102" whip in the middle of the roof will work the best, but few of us can put up with that! The shorter the antenna, the less range, and the lower on the vehicle (fender, bumper, etc.), the more directional it becomes.

Most folks choose a magnetic mount – the longest they can tolerate – in the center of the roof. Next choice down would be a fender cowl or trunk door mount. Least desirable would be a short CB whip on a bumper.

Q. Can I hook up computer speakers to my RCA 13" television? Do they require impedance matching? (Ed Bixby, El Segundo, CA)

A. Yes and yes. The audio output of your TV is low impedance (typically 8 ohms), intended to directly drive a speaker voice coil. Unamplified multimedia speakers are also low impedance and can be directly connected to the TV audio. But most computer stereo speaker sets are amplified and high impedance (600 ohms). Actually, one of the two stereo speakers (the lighter one without all the connectors) is unamplified and would work just fine connected to the TV. But you probably want to use both speakers.

Try connecting them to the TV sound output with the volume controls *way* down to begin with. Turn the volume controls up a little at a time so that you don't damage the amplified computer speakers. You want to set the least amount of TV volume which produces adequate volume on the speakers. If it works, fine, but if the sound is loud and distorted, you need a "pad," a variable resistance which approximates the impedance matching and reduces the amplitude of the TV sound output at the same time.

You can easily make a pad with one potentiometer ("pot") with a resistance of roughly 100 to 500 ohms. A good choice would be a Radio Shack part number RSU 11344140. Of course you will also need a 3.5 mm (1/8") stereo jack so you don't have to cut the plug off the speaker cable! And since the amplified speaker system is stereo and the TV output is mono, you will

need to solder together the jack lugs which connect to the tip and ring of the miniplug.

Visualize the rear of the pot, all solder lugs down. The common ("ground") wire from the TV would connect to the center lug (6:00 position) and to the amplified speaker's ground lead (plug barrel). The other wire from the TV would connect to the right-hand lug (5:00 position), and the remaining amplified speaker wire (plug tip and ring) would connect to the left-hand lug (7:00 position).

Looking at the front (control shaft side) of the pot, turn the shaft all the way "off" (counter-clockwise); then advance it just a fraction – barely on. Turn the whole system on, and listen for the sound. Adjust the pot for best sound, while balancing the other controls as well. That should do it.

Q. I recently listened to a local talk radio station whose program was preceded by a caveat advising the listeners that it was a commercial program and that the station was not responsible for its contents. The subject was guns, and this announcement was not used with other programs before or since. Was this a legal requirement? (Mark Burn, Terre Haute, IN)

A. There are many regulations affecting the broadcast media concerning the sensitivities and sensibilities of the listening audience. If a subject is controversial, a station may elect to broadcast a disclaimer before the program airs in an effort to absolve itself from any lawsuits or accusations for slander, misrepresentation, offensive or upsetting statements, etc. It is also a means of implying that the station honors the right of another opinion without necessarily endorsing it.

Q. I'm interested in starting an AM broadcasting station. Where can I find more information on what I need? (Ken, e-mail)

A. AM applications are a tricky business. Directional antennas, night/day power restrictions, propagation, and other considerations require the services of a consulting engineer. For general information on AM or FM broadcasting, visit the FCC Audio Services Division of the Mass Media Bureau web site at www.fcc.gov/mmb/asd.

Q. Can I realign an AM/FM portable radio so that it will receive other services near the old frequencies? (Lance Jones, Machiasport, ME)

A. Not realistically. The shortwave broadcast frequencies are too far removed from the AM medium wave broadcast band to be received even on images, and closer ham transmissions are nearly always in single sideband. Service above the FM broadcast band is AM (aircraft), and below is TV audio, but that's not generally attractive.

By bending the FM coils outward and repeaking the appropriate trimmer capacitors on the back of the variable tuning capacitor, you may be able to coax the radio to receive the 150-174 MHz VHF high band for public safety and business, even a few hams, but since the mode is narrow band FM, the signals will appear to have low audio, and you will hear only the strongest transmissions, which will wipe out the weaker.

Q. I'd like to load up on alkaline batteries now on sale. How shall I care for them to prevent rapid self-discharge in storage? (Mark Burns, Terre Haute, IN)

A. Heat is the enemy of batteries since it accelerates the chemical reaction which generates the current, thus using up the battery chemistry. Store the batteries in a cool, dry place, but not necessarily in a refrigerator as recommended in early writings. Freezer storage will only reduce the discharge a few percent, barely noticeable over the long run.

The smaller the battery, the sooner the self-discharge. There just isn't much chemical reserve there to begin with, so don't overbuy AAA cells! And see if you can determine the manufacture date or expiration date on the package. They could be old to begin with, thus accounting for the special sale!

Questions or tips sent to "Ask Bob," c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: www.grove-ent.com

Gary Webbenhurst
ab7ni@arrl.net

I recently participated in the annual American Radio Relay League (ARRL) sponsored Field Day. This annual June event tests the emergency operating capabilities of amateur radio operators. The goal is simple: set up an emergency transceiver and contact as many other stations as possible. If you are a ham, this keeps your traffic handling skills sharp and renews friendships in the ham community.

If you are not a ham, you can still participate. Listen in on the ham bands or personally visit the field day location in your community. If you visit in person, ask if you can try to make some contacts. Don't worry, it's legal because a licensed ham will be at your elbow as the "control operator." Mark your calendar now for the last full weekend in June 2001.

As always, I snagged an idea or two from the event and here they are:

56 Got an old golf bag? That is what one ham used to carry and protect his dismantled yagi beam elements! (Hmmm, were those radiating elements hacked-up golf clubs?)

57 Field Day is a 24 hour operation; you need nighttime lighting. You can always use a lantern, but this year I tried a new Radio Shack 12v DC lamp. It has a coiled, flexible cord and a bright lamp. Aimed directly on the log sheets, it worked very well. We used a power strip for DC and added a three hole outlet for the lights. At an inexpensive \$4, one or two can be stored in your car, motorhome, boat, and home listening station.

58 As summer ends, there are usually some bargains in the discount stores for tents, screened rooms and folding chairs – all useful at weekend radio DX outings. I especially like the new fabric chairs in a storage tube. Some have a drink holder in the arm rest that is perfect to hold your hand held radio. About \$10.

59 I have been reflecting on my first trip to the **Dayton Hamvention** last May. This is a pilgrimage every radio aficionado should experience at least once. You don't need to be a ham, as there are many companies there that sell scanners, receivers, antennas, and related accessories. There was an unbelievable collection of new products from manufacturers, and literally tons of used equipment.

The prices on radio equipment are unbelievably low. I found the Icom W32A dualband amateur transceiver for \$242. Also the MAHA battery recharger/conditioner for \$19.95: It came with both AC and DC adapter and four 1550 mAh NiMH 1.2 volt AA batteries. Wow! I bought five, as they will make great Christmas gifts. Every mid-May, put Dayton on your calendar, too!

60 At Dayton, I picked up several unique BNC connectors: One was a solderless BNC RG58 connector with a push-on sleeve. Works better than any other I have used. I also found 12 volt cigarette outlet power cords. They came with a 3 amp fuse and a bright green light LED to show that power was on. The ends of the heavy duty coiled cable were simply black and red wires. At the price of 10 for \$8 they were too good to pass up. The same thing in an electronics store would be in the \$3-10 range. Never miss an opportunity at a hamfest.

61 Back to school time. School officials are now big users of radios for security purposes. I suggest you ferret out the school and bus frequencies. Some day it could be important to know what is going on at school. Other school uses include the music band (from director/advisor to the Drum Major) and athletic events. **Note:** Many schools have gone overboard with their zero tolerance of just about everything. If you plan to use FRS to contact your kids while you wait in the car to give them a ride home, you'd best check with school officials first.

62 September and October are two of the worst months for forest fires. For the daily fire status I check into www.nifc.gov/news/sitreprt.html. For a graphical view, try www.nifc.gov/fireinfo/firemap.html. Many states have their own sites. California's is www.fire.ca.gov/2000fireseasonstats.asp.

For our Canadian readers the URL is www.nrcan.gc.ca/cfs/proj/sci-tech/arena/firereport_e.html. There is a link for the French language version, as on most Canadian websites.

(Note: When you see the column \$\$\$CTD you may be in for a shock. That is the cost to date to fight the fire. The cost can run into the millions. The amount of acreage consumed is also depressing. Nevertheless, this is interesting information.)



I have a lengthy, but relatively complete list of all West Coast forestry conservation, US Forest Service, BLM, BIA and National Parks frequencies. If you would like the list in Word 97 format you can email me. If you have a computer programmable radio, I also have datafiles for the Pro 64, 92, 2052, Bearcat 895XLT, Yaesu 10, 11, 50, 51, VX-5R, 2600, and the Icom W32A and 2100H. Let me know if I can save you some keystrokes. Actually that is a *lot* of keystrokes. If you have your own list for your local forest fire related frequencies, I would love to hear from you.

When I started this column last January, *MT* editor Rachel warned me that there would be very limited feed back from readers. She was right – that is, until the July issue. Idea #48 struck some nerves. I dared, make that double dared, readers to get their ham license.

I am pleased to report that over 200 readers wanted my "computer take away all the incorrect answers" version of the question pools. Most requests were for the No Code Technician written test. But a few wanted the General and Extra exams modified in like fashion. Some inquired if this was legal.

Well, the questions are in the public domain, freely downloadable from several sites. The correct answer is already given for each question. I merely went through and deleted all the wrong answers. As a teacher and mentor for many new hams over the years, I found that if students read the wrong answers as many times as they read the correct answer, they can be easily confused at test time.

Of course, studying questions is only part of the process. You need to do some other reading to fully grasp the material. Memorizing a couple of formulas and the band frequency allocations is also handy. I am working on a two-page summary of other basic information that a good ham ought to master. Another good resource is www.hamtest.com. I strongly suggest you take a sample test to make sure you are ready for the real exam. Good luck to all those who took up the challenge.



Richard Barnett
ScanMaster@aol.com

News from a Newbie

We've often used this space to discuss the overall health of our hobby. As all of our readers know by now, in the face of an ever-expanding array of pastimes, particularly the Internet, all hobbies have suffered. Whether it's scanner or amateur radio, model railroading or macramé, people are gradually dropping their old hobby for the high-tech world of surfing the Web. Combine this with the inherent complexities of programming a trunked system, or the local police switching to digital modes, and you have to expect a certain fall-off in interest.

At least with scanning, you know you're always going to have a core group of enthusiasts who will maintain their high level of interest. We see that on the Web every day. You also have a built-in audience of public safety and news media officials who use scanners on or off the job.

Still, we've always tried to encourage you to bring newcomers into the hobby. Steven Bohlen is just one of those people. He posted his experiences on a newsgroup recently and gave us permission to print his comments here in *MT*.

"Well, I thought I would share my latest scanning experience with the group. Thought you all wouldn't mind hearing how exciting this hobby is to some newbies. I started scanning in January of this year after purchasing a BC278CLT from Grove. I've always wanted to buy a scanner, but have only recently had the funds to spend, so I was pretty excited to sit down and listen in to local police and fire. I was immediately hooked, and after buying a shortwave radio a couple of months ago, I bought a BC245XLT last week, after a lot of research. Thanks to the comments on this list and some web sites, I feel like this scanner is just right for how I want to use it.

"Anyway, I received the scanner on Monday and quickly sat down to program. Once I got it working for Columbus, Ohio, Police and Fire, I was amazed at what I was hearing. Shots fired and police foot chases don't happen in the suburbs and outlying areas of Columbus very often – the areas that I had been scanning since those agencies had non-trunked systems – and the action from this 245XLT was awesome.

"Well, I went to work the next day with the scanner, ready for my first full day of trunked scanning while in the car. Boy, was I in for it. On my way home from work, I heard some talk of closing down I-270, which is the interstate outerbelt around Columbus that I take on my 35 minute drive home each night. For some reason I thought I misunderstood what was going on and hopped on I-270 anyway. What a mistake. They did shut it down and my usual trip home turned into a 2 hour drive with multiple detours. The problem was that there was a fatal auto accident and it was a big one. Apparently, the county shut down the freeway because of the accident, yet it was the responsibility of the Columbus PD to ensure that traffic could be re-directed.



"My scanner was going crazy with activity – dispatchers calling units from other precincts to help out with traffic and the inability to call units to non-priority crime locations due to the fact that 'all available units are directing traffic on I-270,' in addition to a squad call to the main detour area where a diabetic was having some problems, and a call to a police chopper to locate a blue Chevy that was ramming cars just to get off of the freeway. Man, what excitement and what a mess! One of the worst traffic scenes ever in Columbus turned out to be action for my first day of scanning the Columbus trunked systems.

"I know; some, if not most, of you couldn't

imagine a traffic accident leading to this much excitement, but it did for me. And that is the point of my sending this message to all of you. Ever since I've been a part of the radio community, I've heard multiple doomsday stories. Most of them relate to how the SWL, scanning, and amateur radio hobbies are dying out and how technology has pushed people away from radio. Well, I am here to tell you that I am one hobby newbie that now considers this a lifelong hobby. For those who think this hobby is dying, well, maybe it is. But not for me. It is lists like this that get people involved and coming back for more. So keep it up. I can only hope to know 50% of what you all know in the next 100 years. Keep sharing the knowledge!"

This is a great example of how a single positive experience with a scanner can make one a hobbyist for life. The more newcomers to the hobby, the more product the manufacturers will sell, and the more they sell, the more new features and models we'll see. Thanks, Stephen. We hope that as you become an experienced hobbyist you'll entice others to the hobby as well. If you are either a novice or old-time scanner user, Stephen would like to hear from you. You can reach him at sbohlen@netwalk.com.

❖ Scanner Suggestions

John Myers wrote us recently and asked for a scanner recommendation, one of the more common requests that we receive:

"Mr. Barnett; Always enjoy your articles in *Monitoring Times*. I would appreciate your opinion on the following: I would like a better than average general purpose scanner like the BC9000; but, I find that they are not available anymore. I have been told that the new Uniden BC780 with the trunking feature turned off will be a better scanner than the BC9000. I live in a small town miles from the big city and probably will never have use of the trunking feature. Should I wait for the new BC780 or continue looking for a used BC9000?"

John, it sounds like you are in the market for a base scanner, which certainly narrows down your options quite a bit. Handheld units are the most popular type of scanner, but base models

are generally better for home, office or even mobile use, simply because of their size and ease of control.

If you are not interested in trunking, your options do expand, however. The high-end manufacturers, such as ICOM and AOR, do not offer trunking and this has put them at a huge disadvantage in the United States where trunking is so prevalent. ICOM and AOR make excellent receivers, but they can be complicated to use and they are expensive. If your budget runs from \$500 up through \$1200 or so, you should certainly check Grove Enterprises and well as other dealers of sophisticated "communications receivers" to investigate your options.

Because you want a base scanner, your options also include black-box devices, such as the Optoelectronics Optocom, WinRadio and the ICOM PCR model line. These units require a PC to be connected to them for full computer control, but with their software interface you're suddenly able to take advantage of a world of new features including recording audio to WAV files, logging transmission duration, scanning an unlimited number of channels, and more.

If you're like most users, though, you want a stand-alone device with a hearty feature set. The Bearcat BC-9000 was just such an animal. It had a very good receiver, an alpha display, the CTCSS tone board option, multiple modes and

step sizes, and more. Many hobbyists have felt the same way about their PRO-2004 and PRO-2006 scanners from GRE, but these are long-since discontinued.

So, with all this in mind, what's available now or in the near future? The Radio Shack PRO-2052 is one option. It has trunking, but it's a fine standard scanner as well. The GRE-built Radio Shack PRO-2067 is another consideration. It is slightly smaller than the BC-780 and probably more suited to the car. It has trunking of course, but you can disregard that, if need be. GRE has always made excellent receivers and the CTCSS decode capability in the radio is unmatched.

The Bearcat BC-780 would certainly be an excellent choice. It will have some brand new trunking capability that you will not need, but its non-trunking feature set is also impressive. The BC-780 could be used like a black-box receiver under computer control. It has much wider band coverage and a VFO, has ten pre-programmed service search ranges, and a host of other features.

Good luck and please let us know your decision.

❖ Air Phones

Bill Crocker supplied us with some interest-

ing information on GTE's airfone system that is ubiquitous across our friendly skies. For those who are lucky enough not to fly often (the planes are like cattle pens of late and most airlines still don't let you play with your scanner on-board), these air telephones are found between seats or on the seat back in front of you. We have heard from reliable sources that the business has not been doing well for some time. We rarely see people using the phones, so this does not surprise us. They are incredibly expensive to use, often require you to shout to be heard, and can drop connections fairly easily. Mostly what you hear your seat neighbor say one on of these devices is, "Hey, guess where I'm calling from!"

At any rate, according to Bill, these systems use AM SSB with narrowband spacing. If you work for the government and have a court order to listen to these phones you'll probably need a multi-mode high-end ICOM or AOR with narrowband filtering, if not something more sophisticated.

GTE AIRPHONE : All stations on AM single sideband (A3A). 32 channels are assigned to each transmission site using 6 kHz channel spacing. Below are the lowest frequencies used for each site.

| | |
|----------------|---------|
| ABAJO PEAK UT | 945.204 |
| ALBUQUERQUE NM | 945.804 |



external unit pictured

WINRADIO WR-1550 Computer Receiver

New, WR-1550 Computer Receiver with improved dynamic range! With continuous 150 kHz - 1500 MHz frequency coverage (less cellular), multimode detection (AM, NFM, WFM, USB, LSB, CW), IF shift (+/-2 kHz), sharp selectivity (2.5, 6, 17, 230 kHz), high sensitivity (0.3 uV SSB and NFM), built-in spectrum display (up to 10 MHz span), and triple superheterodyne conversion, this is the receiver that sets the standards! *Requires Windows 3.1, 95, 98, Millennium, NT, or 2000.*

Choose from two models: the WR1550e external module for convenient use with a portable computer - \$549.95 plus \$11.95 shipping (order RCV47-e), or the WR1550i to plug into an unused ISA port in your desktop computer - \$499.95 plus \$11.95 shipping (order RCV47-i).

**Grove Enterprises, Inc. is
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Brasstown, NC 28902

fax: 828-837-2216

email: order@grove-ent.com

| | |
|------------------|---------|
| ATLANTA GA | 945.404 |
| AUSTIN TX | 945.204 |
| BOSTON MA | 945.204 |
| BRIDGETON MO | 944.604 |
| BURLINGAME CA | 945.204 |
| CHARLESTON SC | 944.604 |
| CHARLESTON WV | 944.204 |
| CHICAGO IL | 945.804 |
| DELTA UT | 944.204 |
| DENVER CO | 944.604 |
| DES MOINES IA | 944.204 |
| FORT WAYNE IN | 945.204 |
| GRAND ISLAND NE | 944.404 |
| HAWTHORNE NV | 945.604 |
| HOUSTON TX | 945.404 |
| IRVING TX | 944.804 |
| JAMACIA NY | 945.204 |
| KALMATH FALLS OR | 945.884 |
| LAS VEGAS NV | 945.404 |
| LOS ANGELES CA | 944.604 |
| MERIDIAN MS | 945.604 |
| MIAMI FL | 944.404 |
| MOHANAS TX | 945.004 |
| NASHVILLE TN | 944.404 |
| NEW ORLEANS LA | 945.004 |
| ORLANDO FL | 945.004 |
| PHOENIX AZ | 944.804 |
| PITTSBURGH PA | 944.804 |
| SEATTLE WA | 944.604 |
| SHREVEPORT LA | 945.804 |
| SPRINGFIELD MO | 945.404 |
| TALLAHASSEE FL | 944.804 |
| WASHINGTON DC | 944.604 |
| WILMINGTON NC | 945.204 |
| WOODWARD OK | 945.604 |
| NATIONWIDE CHNL | 899.000 |

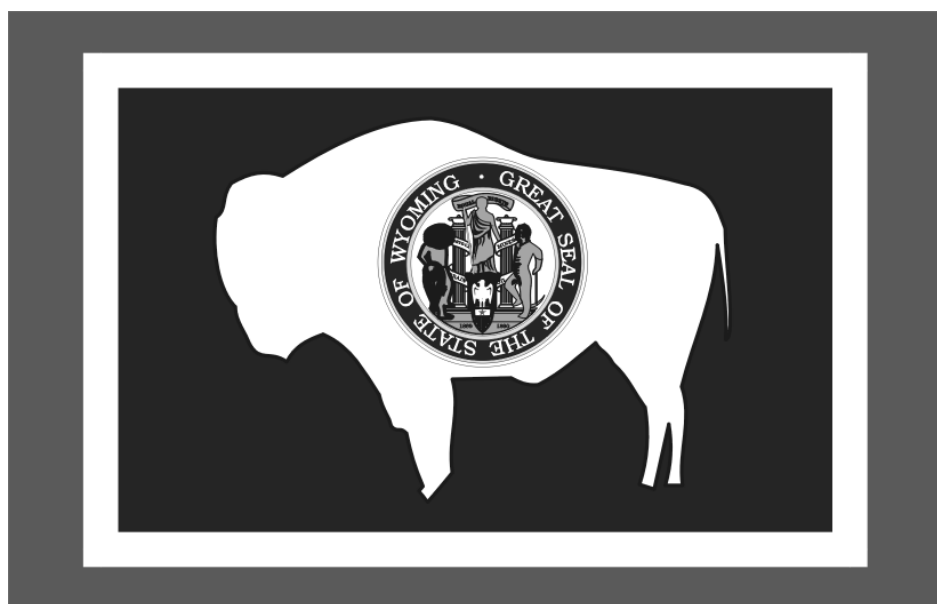
Channel Spacing: Every 6 kHz 944.204 - 944.210. Last channel is 10 kHz above previous.

❖ Wyoming Monitoring

While they sure don't have all the action you'll find in New York, L.A., or Chicago, you can certainly find communications to scan in Wyoming. For those of you planning a trip to Yellowstone during the end of the summer or a on skiing vacation later in the year, below you'll find some selections from the Wyoming "Beyond" chapter of the new *2001 Police Call*. The complete new edition will be out any day at your favorite dealer.

HOTELS, RESORTS & CASINOS

| | | |
|---------------------------------|-----------|----------|
| BEST WESTERN LODGE | | |
| JACKSON HOLE | JACKSON | 461.7500 |
| BLACKWATER LODGE | CODY | 463.3500 |
| COVERED WAGON MOTEL INC | LUSK | 461.4250 |
| COWBOY VILLAGE RESORT LLC | JACKSON | 151.7750 |
| DIAMOND GUEST RANCH | CHUGWATER | 461.2500 |
| GRAND TARGHEE RESORT INC | DRIGGS | 151.6850 |
| GRAND TARGHEE RESORT INC | DRIGGS | 151.7750 |
| GRAND TARGHEE RESORT INC | DRIGGS | 151.8050 |
| GRAND TARGHEE SKI & SUMMER RSRT | DRIGGS | 152.2850 |
| GRAND TARGHEE SKI & SUMMER RSRT | DRIGGS | 157.5450 |
| GRAND TETON LODGE CO | MORAN | 154.6000 |



| | | | | | |
|------------------------------|---------------|----------|-------------------------------|-----------------|----------|
| GRAND TETON LODGE CO | MORAN | 463.4000 | MAD RIVER BOAT TRIPS | JACKSON | 464.0000 |
| HITCHING POST INN | CHEYENNE | 464.6750 | SAND WILD WATER | WILSON | 464.6500 |
| IRMA HOTEL INC | CODY | 151.8950 | SNAKE RIVER PARK FLOAT INC | JACKSON | 464.9500 |
| JACKSON HOLE LODGE | JACKSON | 461.0250 | SNAKE RIVER PARK FLOAT INC | JACKSON | 464.9500 |
| JACKSON HOLE MOUNTAIN RESORT | TETON VILLAGE | 151.9250 | STEALTH GUIDE SERVICE | WENATCHEE | 151.9250 |
| JACKSON HOLE MOUNTAIN RESORT | TETON VILLAGE | 460.9250 | STEALTH GUIDE SERVICE | WENATCHEE | 151.9550 |
| JACKSON HOLE MOUNTAIN RESORT | TETON VILLAGE | 465.9250 | T W A SERVICES INC | YELLOWSTONE PAR | 152.4200 |
| PARADISE GUEST RANCH | BUFFALO | 463.8750 | TW RECREATIONAL SERVICES | YELLOWSTONE PAR | 152.4200 |
| PARADISE GUEST RANCH | BUFFALO | 464.1500 | TW RECREATIONAL SERVICES | YELLOWSTONE NAT | 463.4500 |
| RUSTY PARROT LODGE | JACKSON | 464.5750 | WILDLIFE OF THE AMERICAN WEST | JACKSON | 461.6000 |
| SNOW KING RESORT | JACKSON | 151.8050 | WYOMING RIVER TRIPS | CODY | 463.2000 |
| SNOW KING RESORT | JACKSON | 151.8350 | WYOMING RIVER TRIPS | CODY | 461.5000 |
| SOJOURNER INN | TETON VILLAGE | 464.4250 | YELLOWSTONE PARK SERVICES | GARDINER | 463.4500 |
| SPRING CREEK RESORT | JACKSON | 464.4750 | | | |
| TERRY BISON RANCH RESORT | CHEYENNE | 461.4250 | | | |
| TETON PINES RESORT | JACKSON | 467.7625 | | | |
| TETON PINES RESORT | JACKSON | 467.7875 | | | |
| TETON PINES RESORT | JACKSON | 467.8125 | | | |
| TETON PINES RESORT | JACKSON | 467.8375 | | | |
| THE WORT HOTEL | JACKSON | 464.3500 | | | |
| VIRGINIAN LODGE | JACKSON | 462.8000 | | | |

RECREATION, CONVENTIONS AND CULTURAL ATTRACTIONS

| | | |
|--------------------------------|---------------|----------|
| BARKER EWING RIVER TRIPS | JACKSON | 463.6500 |
| BRUG HUNTING CAMP | RECLUSE | 154.5150 |
| BUFFALO BILL HISTORICAL CENTER | CODY | 157.5600 |
| BUFFALO BILL HISTORICAL CENTER | CODY | 157.6200 |
| CHEYENNE LITTLE THEATRE | CHEYENNE | 464.5000 |
| CODY CLUB | CODY | 151.8650 |
| CODY STAMPEDE | CODY | 154.5150 |
| ELK REFUGE SLEIGH RIDE | JACKSON | 461.1750 |
| HELL ON WHEELS RODEO CLUB | CHEYENNE | 151.6550 |
| HELL ON WHEELS RODEO CLUB | CHEYENNE | 151.6850 |
| HIGH COUNTRY SNOWMOBILE TOURS | JACKSON | 463.2000 |
| JACKSON HOLE AERIAL TRAM INC | TETON VILLAGE | 464.8250 |
| LEWIS & CLARK EXPEDITIONS INC | JACKSON | 157.5600 |

SPORTS & STADIUMS

| | | |
|----------------------------------|---------------|----------|
| CASPER MOUNTAIN RACERS | CASPER | 151.7450 |
| HIGH MOUNTAINS HELICOPTER SKIING | JACKSON | 152.3600 |
| JACKSON HOLE ALPINE RACING TEAM | JACKSON | 157.5600 |
| JACKSON HOLE ALPINE SLIDE | JACKSON | 157.5600 |
| JACKSON HOLE SKI CORPORATION | JACKSON HOLE | 151.7150 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 151.7150 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 151.8350 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 152.3000 |
| JACKSON HOLE SKI CORPORATION | JACKSON HOLE | 152.4200 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 462.1500 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 463.2500 |
| JACKSON HOLE SKI CORPORATION | TETON VILLAGE | 464.8250 |
| SNOW KING SKI PATRL | KEMMERER | 157.6200 |
| SAFARI CLUB INTERNATIONAL | TUCSON | 463.5750 |
| SNOW KING INC | JACKSON | 464.9750 |
| SNOWY RANGE SKI AREA | LARAMIE | 461.7000 |
| WYOMING HORSE RACING INC | EVANSTON | 151.7450 |
| WYOMING HORSE RACING INC | EVANSTON | 152.3600 |

Scanner Logs



Larry Van Horn

larry@grove-ent.com

Maryland State Patrol (Revisited)

Courtesy of Mike Agner

Maryland State Patrol (MSP) underwent a major revision of their frequency/channel pairings a few years back, after Baltimore County virtually abandoned low-band following installation of their 800 MHz system. You may recognize some of these as old county frequencies. The standard Private Line tone the Maryland State Patrol (MSP) uses is 110.9 Hz.

39.100 A1 Statewide-several locations F1 [none]
39.260 KGB 744 A2
39.240 Same B4 [146.2]
39.620 KGB 744 B16 Pikesville
39.340 KGB 744 B15 Pikesville [127.3]

Washington Metro Troop:
39.300 KGH 654 A10 Barrack L/Forestville
39.320 KGE 796 A9 Barrack N/Rockville
39.260 KSU 469 Barrack Q/College Park

Baltimore Metro Troop:
39.140 KGF 986 B9 Barrack J/Annapolis
39.040 KBT 576 B10 Barrack P/Glen Burnie
39.440 KGN 485 B14 Barrack R/Golden Ring

Northeast Troop:
39.320 KGA 919 B12 Barrack D/Bel Air
39.840 KGG 903 B11 Barrack F/North East
39.240 KIL 718 B13 Barrack M/JFK Highway/Perryville [127.3]

Central Troop:
39.420 KGA 915 A8 Barrack A/Waterloo
39.400 KGA 918 A6 Barrack B/Frederick
39.520 KGA 917 A7 Barrack G/Westminster

MSP patrols in Carroll County, so the Westminster barracks are echoed on their 800 MHz system. So occasionally, you will see MSP vehicles with the tell-tale "cell phone" looking antennas. Of course, they do also use cell phones from time to time. I'm not sure whether all transmissions on 39.520 are echoed, however. Lindsay Blanton's web site (<http://www.lcblanton.com/trunked.htm>) has a good listing of talk groups for the Carroll county system.

Southern Troop:
39.060 KGA 916 A11 Barrack H/Waldorf
39.380 KGD 716 A12 Barrack T/Leonardtown
39.280 KGD 979 A13 Barrack U/Prince Frederick

Eastern Troop:
39.780 KGA 913 B6 Barrack E/Salisbury
39.960 KGA 912 B7 Barrack V/Easton

Detachment/Cambridge, Detachment/Denton
39.800 KGD 631 B8 Barrack S/Centerville

Detachment/Chestertown
39.600 KZI 386 B5 Barrack V/Berlin

Detachment/Princess Anne
Western Troop: 39.240 KGA 910 A4 Barrack C/Cumberland
39.340 KGA 914 A5 Barrack O/Hagerstown
39.080 KGA 910 A3 Barrack W/McHenry

Other Frequencies:
39.660 Criminal Investigation Division (CID) [?]
44.740 MSP Medevacs (SYSCOM) **
You can also hear locator data bursts here that evidently can be read with a good packet TNC
47.660 MSP Medevacs (patient status to hospitals)
39.560 MSP Medevacs (tie to Baltimore County Police ground units) [none?]

The freqs listed to MSP Marine (39.200 and 39.220) were transferred to the DNR some years back. Many thanks to Mike for this fine update.

Chicago Area Frequencies

Thanks to the fine folks at CARMA (Chicago Area Radio Monitors Association) (TandKMoran@aol.com) for passing along this extensive list of Chicago area frequencies. Be sure to visit their website at <http://www.theramp.net/shabec/carma.htm>.

Chicago Police Department Radio Communications Systems

Citywide radio channels

| CW# | Freq | Tone | Use |
|-----|---------|-------|--|
| CW1 | 460.125 | 173.8 | Auto accident, traffic, gangs, housing, CTA |
| CW2 | 460.175 | 123.0 | Detectives, canine, mounted, deputies, IAD, vice, ET's |
| CW3 | 460.275 | 141.3 | Wanted flashes, maintenance, films, admin |
| CW4 | 460.325 | 192.8 | Human relations, schools, youth, marine |
| CW5 | 460.350 | 097.4 | Subway communication system / emergency or event secondary |
| CW6 | 460.250 | 162.3 | Emergency or event primary / alternate zone dispatch |
| CW7 | 460.300 | 131.8 | Command, phone patch, pagers, beepers |
| CW8 | 460.525 | 179.9 | Channel "five" simplex unit to unit short range |

Zone Dispatch Channels

| Zone | Freq | Tone | Districts |
|------|---------|-------|-----------|
| Z01 | 460.475 | 107.2 | 16/17 |
| Z02 | 460.050 | 127.3 | 19/23 |
| Z03 | 460.225 | 110.9 | 13/14 |
| Z04 | 460.150 | 114.8 | 1/18 |
| Z05 | 460.500 | 167.9 | 2/21 |
| Z06 | 460.400 | 156.7 | 7/8 |
| Z07 | 460.075 | 146.2 | 3 |
| Z08 | 460.200 | 136.5 | 4/6 |
| Z09 | 460.025 | 091.5 | 5/22 |
| Z10 | 460.100 | 151.4 | 10/11 |
| Z11 | 460.375 | 186.2 | 20/24 |
| Z12 | 460.425 | 094.8 | 15/25 |
| Z13 | 460.450 | 103.5 | 9/12 |

Specialized Units

| | |
|----------|---|
| 472.9375 | Mass Transit (127.3) |
| 155.370 | Point Aid (000.0) |
| 155.475 | ISPERN Radios F1 (000.0) |
| 154.650 | ISPERN Radios F2 (000.0) |
| 156.000 | Aid with Metro Enforcement Groups (000.0) (Defund?) |

Trunked System: 856.9375 857.9375 858.9375 859.9375 860.9375 865.8875 865.9125

Data System: 865.9375 865.9625 866.1875 866.2125 866.3375 866.5625 866.5875 866.6750 866.8125 867.1000 867.1750 867.5375 867.6375 867.6500 867.7375 867.7625 868.1000 868.2250 868.3000 868.3250 868.3500 868.5750 868.6750 868.7250 868.8000 868.8250

Chicago Fire Department Radio Systems

| CH | Output | Input | CTCSS | Comments |
|----|----------|----------|-------|--|
| F1 | 154.130 | 153.950 | 156.7 | Main - Northside dispatch repeater |
| F2 | 153.770 | 154.010 | 156.7 | Englewood - Southside dispatch repeater |
| F3 | 154.220 | 154.220 | 156.7 | Administrative simplex |
| F4 | 153.830 | 153.830 | 156.7 | Fire ground primary simplex |
| F5 | 154.385 | 154.385 | 156.7 | Command channel simplex |
| F6 | 154.295 | 154.295 | 156.7 | Alt. fire ground/Executive channel simplex |
| F7 | 154.265 | 154.265 | 156.7 | Nifern/Mabas fire aid simplex |
| F8 | 154.280 | 154.280 | 156.7 | South suburban fire aid network simplex |
| F1 | 119.250 | 119.250 | (AM) | O'Hare crash trucks to tower (emergency) |
| F2 | 121.900 | 121.900 | (AM) | O'Hare crash trucks to tower (ground) |
| F3 | 121.750 | 121.750 | (AM) | O'Hare crash trucks to tower (ground) |
| F4 | 132.700 | 132.700 | (AM) | O'Hare crash trucks to tower (tower alt.) |
| F1 | 121.300 | 121.300 | (AM) | Meigs crash trucks to tower (tower) |
| F2 | 121.800 | 121.800 | (AM) | Meigs crash trucks to tower (ground) |
| F1 | 121.650 | 121.650 | (AM) | Midway crash trucks to tower (ground) |
| | 155.025 | 155.025 | 000.0 | ESDA/IEMA ESMARN civil defense /aid |
| | 158.895 | 158.895 | 203.5 | Shops |
| | 460.575 | 465.575 | 107.2 | American Red Cross disaster services |
| | 461.500 | 466.500 | 146.2 | Salvation Army fire canteen service repeater |
| | 851.9125 | 806.9125 | D703 | BECMA/Aid/Phone Patch |
| F1 | 851.9125 | 806.9125 | 000.0 | Communications relays/links |
| F2 | 851.9375 | 806.9375 | 000.0 | Communications relays/links |

| | | | | |
|----|----------|----------|-------|-----------------------------|
| F3 | 852.8625 | 807.8625 | 000.0 | Communications relays/links |
| F4 | 852.9125 | 807.9125 | 000.0 | Communications relays/links |
| F5 | 852.9375 | 807.9375 | 000.0 | Communications relays/links |

EMS Services

| | | | | |
|----|---------|---------|-------|--|
| F1 | 460.600 | 465.600 | 156.7 | EMS North dispatch |
| F2 | 460.625 | 465.625 | 156.7 | EMS South dispatch |
| F3 | 462.950 | 467.950 | 156.7 | EMS Primary alternate repeater "data" |
| F4 | 462.975 | 467.975 | 156.7 | EMS Secondary alternate repeater "command" |
| F5 | 458.025 | 458.025 | 203.5 | Special events channel 5 |
| F6 | 458.075 | 458.075 | 210.7 | Special events channel 6 |
| F7 | 458.125 | 458.125 | 218.1 | Special events channel 7 |
| F8 | 458.175 | 458.175 | 225.7 | Special events channel 8 (note: not all EMS rigs/ portables have channels 5-8 installed) |

EMS -To- Hospitals

| | | | | |
|-------|---------|---------|--------|---|
| Med1 | 463.000 | 468.000 | Varies | ALS hospital working channel (duplex) |
| Med2 | 463.025 | 468.025 | Varies | ALS hospital working channel (duplex) |
| Med3 | 463.050 | 468.050 | Varies | ALS hospital working channel (duplex) |
| Med4 | 463.075 | 468.075 | Varies | ALS hospital working channel (duplex) |
| Med5 | 463.100 | 468.100 | Varies | ALS hospital working channel (duplex) |
| Med6 | 463.125 | 468.125 | Varies | ALS hospital working channel (duplex) |
| Med7 | 463.150 | 468.150 | Varies | ALS hospital working channel (duplex) |
| Med8 | 463.175 | 468.175 | Varies | coordination/assigning channel/calling/alt. |
| Merci | 155.400 | 155.400 | Varies | Merci400 North BLS transports |
| Merci | 155.340 | 155.340 | Varies | Merci340 South BLS transports |

City of Chicago Local Government Services

| Dept of Transportation/Streets and Sanitation | | | | |
|---|----------|-------|--|--|
| F1 | 453.650 | 107.2 | Streets & Sanitation / Snow Command North | |
| F2 | 453.725 | 107.2 | Streets & Sanitation / Forestry / Animal Control | |
| F3 | 453.775 | 107.2 | Streets & Sanitation / Police Towing | |
| F4 | 453.825 | 107.2 | Streets & Sanitation / Bureau of Electricity / Fire Alarm Repairs / Snow | |
| F5 | 453.975 | 107.2 | Streets & Sanitation / Sewer Crews / Traffic Signals/Heating Compliance | |
| F6 | 453.675 | 107.2 | Streets & Sanitation / City Pagers | |
| F7 | 453.500 | 000.0 | Streets & Sanitation / Snow Command South | |
| F8 | 453.550 | 107.2 | Streets & Sanitation / Rodent Control | |
| F9 | 453.750 | 107.2 | Streets & Sanitation / Human Resources | |
| F10 | 853.2125 | Unkn | Streets & Sanitation Radio Technicians | |
| | 453.625 | 107.2 | City Pagers | |
| | 158.250 | D412 | Water Department South | |
| | 158.880 | D411 | Water Department North | |
| | 453.9625 | | Water Department Plant Operations | |
| | 453.050 | 127.3 | McCormick Place Operations, Other Agencies | |
| | 453.100 | 107.2 | City Supervisors & Telephone Technicians | |

Streets & Sanitation/Snow Command Identifiers

| | |
|------------|---|
| District 1 | Northwest District 4 South & Southwest |
| District 2 | North & Near North District 5 Southeast, some Southwest |
| District 3 | North & South Central |
| R1 | Wacker Drive Parking Area |
| R2 | First Ward (Downtown) |
| R3 | Snow Command |
| Q1 | Dispatchers |
| Q2 | Commissioners |
| Q3 | Engineers |
| Q4 | Tire Shop |
| Q5 | Motor Pool |
| Q6 | Motor Truck Drivers West |
| Q7 | Motor Truck Drivers North |
| Q8 | Motor Truck Drivers South |
| Q9 | Chaffeurs |
| Q10 | Security |

KPH Rises from the Dead

You couldn't be a radio fan growing up in California and not know about KPH, the De Forest/Marconi/RCA/MCI/Globe

Wireless station north of San Francisco. As one can see from the owners' names alone, KPH was a big one. The "PH" stood for Palace Hotel, the San Francisco building where the first station was destroyed by the great 1906 earthquake. Some called KPH "The Wireless Giant of the Pacific," but many radio operators knew it as the "Power House," from its window-rattling Morse code (CW) signals.

Marconi moved KPH to dramatically rugged, windswept Point Reyes, an incredible peninsula thrust into the Pacific by plate tectonics. The first station was near a spot still known as Marconi Cove.

RCA bought KPH in the 1920s and built two large sites. The receivers were near a lagoon at the north end of the point, and the transmitters were clear at the south end, near Bolinas. Two huge antenna farms sprouted, with hundreds of wooden poles holding up miles of some of the most potent wire antennas ever designed for HF (high frequency/short wave).

KPH handled 600 to 1000 commercial messages a day in the 1960s, but then the industry went to satellites and traffic dropped off dramatically. RCA sold the station to MCI. Ultimately, Globe Wireless incorporated KPH into its growing, worldwide network, where the call still can be heard as an identifier in digital markers. In 1997, though, Globe closed the now-redundant Point Reyes sites, and last summer they finally opted to give all their commercial Morse a quick death instead of a sad, unprofitable wasting away.

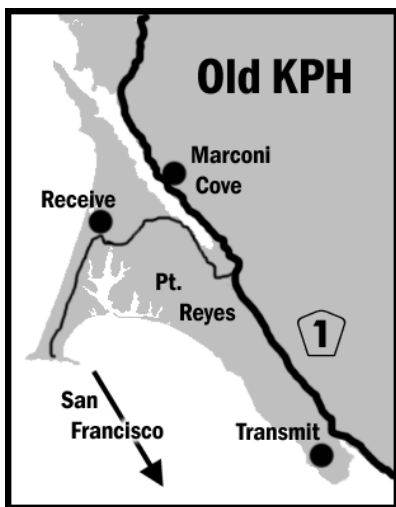
Somehow, though, everyone knew the old KPH was too big to die. A deal was struck with the National Park Service, owners of the surrounding Point Reyes National Seashore, to purchase and preserve small parts of both sites as a radio museum. The Maritime Radio Historical Society, a group of very dedicated radio operators in northern California,

obtained an amateur call, K6KPH, and finally got Globe's permission to use the "real" KPH call on several of its original frequencies.

This year, KPH CW spoke again. The historical society is restoring the original transmitters and antennas used in

the station's heyday, and plans yearly, on-air events around the anniversary of Globe's last Morse. This also fortuitously happens to nearly coincide with International Marconi Day. CW broadcasts will be made on all frequencies, using vintage paper tape readers, and ship calls will be taken. At press time, several markers were intermittently audible.

KPH is an amazing station in an amazing place, and now it's back. Here are the frequencies, in kilohertz (kHz):



KPH Demonstration Frequencies

(CW Morse Telegraphy)

| Coast | Ship Calling | |
|---------|--------------|---------|
| 426 | (simplex) | |
| 500 | (simplex) | |
| 4247.0 | 4184.0 | 4184.5 |
| 6477.5 | 6276.0 | 6276.5 |
| 8618.0 | 8368.0 | 8369.0 |
| 13002.0 | 12552.0 | 12553.5 |
| 17016.8 | 16736.0 | 16738.0 |

RTTY Broadcasting?

No, it's not April Fool. Those transmissions on 6994 and 13972 kHz radioteletype (RTTY) are for real. It's WA9XHN, which holds forth several times daily as "America's Broadcast RTTY Station." The location is Auburn, Washington, south of Seattle.

As many know, the "X" in this case denotes a Federal Communications Commission license from its experimental block, authorizing its holder to develop some kind of radio project. In this case, George Hutchison, W7KSJ, is restoring a broadcast transmitter to send RTTY with a 170-Hz shift at 75 baud. This is a common setting used by hams, and most computers can

copy the signal with free software and a simple cable straight to the sound card. Of course, the frequency displayed on your radio can vary plus or minus up to 2 kHz depending on how it tunes this mode. Most people will use LSB, which will read higher if not offset.

Schedules are highly variable, but most of the time he seems to go with 0000 and 0400 Coordinated Universal Time (UTC) on local weekdays (Friday becomes Saturday in UTC). Expanded schedules are broadcast on weekends and holidays. Recently, UTC Saturday was 1300, 2000, along with the 0 and 4 hours. UTC Sunday was 0100, 0700, 1500, and 2300. The 6 megahertz (MHz) frequency is used at night, and the 13 in the day. More current schedules may be at George's web site, www.rtty.com.

Will MARS adopt PSK31?

We've finally heard PSK31 (31.25-baud, phase-shift-keyed, direct teleprinting) outside the amateur bands. The announcement of this new mode, which ran in the May 1999 issue of a ham magazine, was at first taken as yet another April Fool. But it was not. PSK31 really does work as well or better than RTTY, in a bandwidth comparable to CW. However, I'd been holding off writing about it until someone used it on a utility frequency.

PSK31 has a very distinctive, high-pitched, audio warble around 1000 Hz. To hear more of these than you ever wanted to, tune to 14070 kHz in the amateur 20-meter band. If conditions are even average, there'll be at least ten stations bleeping away in the space of maybe 1.5 kHz, none of them having the least problem with interference. In fact, there is usually room for ten more.

Another free computer program, Digipan, shows where we are with sound-card DSP (digital signal processing). Instead of twiddling your tuning knob, you set it once and mouse-click your desired wiggle on a panoramic spectrum scope. Strong signals look like railroad tracks, and weaker ones look like DNA molecules. Once again, the interface to your radio is a cable from the output jack. I bought mine for five bucks at Radio Shack. We're a long way from current loops and hot-oil smells!

It was only a matter of time before MARS, the US Military Affiliate Radio System, gave PSK31 a try. Now, Jack Metcalfe has copied AFA2QG, an Air Force MARS station, using this new mode to work AAR3JI, US Army MARS, on 7914 kHz. As usual with this mode, the copy was great. We're going to hear a lot more of these funny warbles.



Hugh Stegman

Abbreviations used in this column

| | |
|----------|--|
| AFB | Air Force Base |
| ALE | Automatic Link Establishment |
| AM | Amplitude Modulation |
| ARQ | Automatic Repeat Request teleprinting system |
| ASCIET | All Services Combined Identification Evaluation Team |
| ASCII | American Standard Code for Information Interchange |
| CAMSLANT | Communication Area Master Station, Atlantic |
| CIA | US Central Intelligence Agency |
| CW | Morse code telegraphy ("Continuous Wave") |
| ELT | Emergency Locator Transmitter |
| FACSFAC | Fleet Area Control and Surveillance Facility |
| FEC | Forward Error Correction teleprinting system |
| JSTARS | Joint Surveillance Target Attack Radar System |
| LSB | Lower Sideband |
| MARS | Military Affiliate Radio System |
| MFA | Ministry of Foreign Affairs |
| MWARA | Major World Air Route Area |
| NATO | North Atlantic Treaty Organization |
| NAVTEX | Navigational Telex |
| NAWS | Notice to Allied War Ships |
| PacTOR | Packet Teleprinting Over Radio |
| RCA | Radio Corporation of America |
| RIMPAC | Pacific area naval exercise |
| RSA | Republic of South Africa |
| RTTY | Radio Teletype |
| SELCAL | Selective Calling |
| SITOR | Simplex Teleprinting Over Radio |
| UK | United Kingdom |
| Unid | Unidentified |
| US | United States |
| USS | United States Ship |
| USCGC | US Coast Guard Cutter |
| VHF | Very High Frequency |
| VOLMET | Aviation weather observations |

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association.

- 518.0 ZSC-Cape Town Radio, RSA, with Navtex in Sitor-B, at 1625. (Bob Hall-RSA)
- 2749.0 Saint John-Canadian Coast Guard, with New Brunswick weather and bulletins in English and French, at 0157. (Ron Perron-MD)
- 3658.0 "V"-Russian Single Letter CW marker, Khiva, weak at 1857. (Takashi Yamaguchi-Japan)
- 4014.0 Backward Music Station-Unid, weird tones (Enigma XM), at 2021. (Yamaguchi-Japan)
- 4027.0 Cuban CW cut "numbers" (M8), with 5-figure groups at 0310. (Tom Severt-KS)
- 4073.0 Pseudo Time Signal Station, Moscow, Russia (M18), sending times 4 hours ahead of UTC, in CW at 1822. (Yamaguchi-Japan)
- 4216.0 KPH-San Francisco Radio [*Globe still uses the call sign commercially from Dixon -Hugh*], with SITOR-B weather, at 0521. (Severt-KS)
- 4247.0 KPH-New radio museum at Pt. Reyes, CA, using original RCA transmitters and antennas, with markers in CW, parallel on 6477.5 and 13002, at 2330. (Hugh Stegman-CA)
- 4331.0 4XZ-Israeli Navy, Haifa (M22) with usual CW marker at 2043. (Yamaguchi-Japan)
- 4372.0 Giant Killer-US Navy FACSFAC,VA, setting up an alligator playground (tracking data network) for "3-U-X" and a battle group, also linked on VHF, at 0135. (Perron-MD)
- 4461.0 Cuban "Atencion" (V2), with AM "numbers," weak and in progress at 1420. (Yamaguchi-Japan)
- 4575.0 Unid-CW station repeating "V ABYZ DE 6PXJ," at 1348. (Yamaguchi-Japan)
- 4625.0 The Buzzer-Strange Russian "numbers" channel marker (S28), usual buzzes in AM at 2055. (Yamaguchi-Japan)

- 4635.0 The Counting Station-US CIA, with AM "numbers" (E5) in 3/2 figure groups, at 0227. (Severt-KS)
- 4646.0 "V"-Russian Single Letter CW marker, Khiva, made a short pause, then resumed sending at 1353. (Yamaguchi-Japan)
- 4720.0 "Tango"-unknown military, in operator chat and data link setup with "Kilo," probably players in the RIMPAC 2000 exercise, at 0212. (Perron-MD)
- 4739.0 Wafer 747-US Navy P-3C, passing a Spare Group report to Golden Hawk (US Navy, ME) at 0047. (Perron-MD)
- 4742.0 Ascot 5361-British Royal Air Force C-130, working Architect (RAF headquarters, UK), at 0058. (Perron-MD)
- 4878.0 "V"-Russian Single Letter CW marker, Khiva, weak at 1354. (Yamaguchi-Japan)
- 5135.0 Cuban "Atencion" (V2), with 5-figure groups of Spanish AM "numbers," at 0227. (Severt-KS)
- 5154.0 "F"-Russian Single Letter CW marker, Vladivostok, simultaneous with "K," Peteropavovsk-Kamchatsky, both at 1200. (Yamaguchi-Japan)
- 5238.0 Unid-Sounded like the CIA "Counting" station (E5), with English "numbers" in 3/2 groups, repeated the message after "Count 159" at 0325, ended at 0340. (Gary Cohen-MA)
- 5419.0 Cuban CW cut "numbers" (M8), in progress at 0337. (Severt-KS)
- 5435.0 ART-Mossad, Israel (E10), with callup and "numbers" message at 2030. (Yamaguchi-Japan)
- 5435.5 Unid-CW station repeating "V CP17 DE L9CC," at 1148. (Yamaguchi-Japan)
- 5680.0 NGWB-Unknown US Navy, with coded traffic at 0120. (Jeff Haverlah-TX)
- 5696.0 CAMSPAC Point Reyes-US Coast Guard, CA, working Coast Guard 2110, a helicopter over FL, at 0031. (Perron-MD)
- 5860.0 Unid-CW "numbers" station (M10), with repeated 555 818 callup, then group count of 33 and 5-figure group message, at 0345. (Severt-KS) *Probably Czech; nice catch. -Hugh*
- 5870.0 Unid-North Korean female "numbers," also on 4770 kHz, both at 1000. (Yamaguchi-Japan)
- 6270.0 ULX-Mossad, Israel (E10), with callup and "numbers" message at 2030. (Yamaguchi-Japan)
- 6666.2 NGHY-US Navy destroyer USS *Peterson*, with coded message at 0222. (Haverlah-TX)
- 6694.0 Kilo 72-Unknown military aircraft, asking Canadian Forces Halifax Military for relay to Jaguar, which he explained was a tactical support comm center (TSCC), at 0205 Navy M8D7, probable US Navy, with a similar request at 0207, and Dragon 02 with similar at 0210. (Perron-MD)
- 6778.0 Unid-US Navy, using a trigraph call, with coded messages at 0055. (Haverlah-TX)
- 6779.0 DHJ59-German Navy Headquarters, Wilhelmshaven, working DRHL (tender *Rhein*), at 0114. DHJ59 working DRES (mine hunter *Weiden*), at 2351. (Perron-MD)
- 6795.0 Juice-Control for US military link coordination net, working Lightning Strike, Duke, and Wallbanger (an E-2C), in ASCIET 2000 exercise, most of day. (Roland McCormick-GA)
- 6815.6 GANTSEC-US Coast Guard Greater Antilles Section, PR, working unheard Coast Guard aircraft escorting a vessel, at 2310. (Perron-MD)
- 6907.0 The English Man-Russian intelligence "numbers" (E6), in powerful AM at 1200. (Yamaguchi-Japan) *That one does blast sometimes. I suspect relay transmitters. -Hugh*
- 6986.0 ART-Mossad, Israel (E10), with callup and "numbers" message at 2100. (Yamaguchi-Japan)
- 7019.0 Unid-Strong carrier followed by unknown 3-digit ID, then 5-digit Slavic "numbers" in AM, ended with "Noil Noil Noil" at 1117. Sounded best tuned in LSB. Definitely a 40-meter intruder, with heavy ham interference. On every Thursday at 1104. (Yamaguchi-Japan)
- 7811.0 VLB2-Mossad, Israel (E10a), with callup only at 1445. (Yamaguchi-Japan)

- 8127.0 CIO2-Mossad, Israel (E10a), with callup only at 2145. (Yamaguchi-Japan)
- 8335.0 DHJ59-German Navy, Wilhelmshaven, working with submarine DRDT at 0023, submarine DRDH at 0033, DRAE (destroyer *Luetjens*) at 0049, DRHL (tender *Rhein*) at 0101, and DRAU (frigate *Koeln*), at 0107. (Perron-MD)
- 8427.0 A9M-Bahrain Radio, with CW marker at 0216. (Camillo Castillo-Panama)
- 8574.0 LGW-Rogaland Radio, Norway, with CW marker at 0220. (Castillo-Panama)
- 8641.0 SYN2-Mossad, Israel (E10a), with callup only at 1445. (Yamaguchi-Japan)
- 8650.0 SPE-Szczecin Radio, Poland, with CW marker and listening frequencies, at 0225. (Castillo-Panama)
- 8699.0 7TF-Boufarik Radio, Algeria, with CW marker and listening channels, at 0230. (Castillo-Panama)
- 8805.0 PCD-Mossad, Israel (E10), with callup and "numbers" message at 1530. (Yamaguchi-Japan)
- 8894.0 Algiers Radio-MWARA AFI-2 net, Algeria, taking position from Springbok 226 at 0126. (Perron-MD)
- 8903.0 N'djamena Radio-MWARA AFI-4, Chad, working various aircraft in English and French, at 0122. (Perron-MD)
- 8967.0 "8-W-O"-US Navy, setting up tactical data link-11 with 7VQ, went to an unknown frequency, possibly another Rimpac 2000 net, at 2258. (Perron-MD)
- 8971.0 Hotel-Unknown British accented speaker, possibly Royal Air Force in the Caribbean, with encoded position for Victor, at 0221. Hunter 01-Possibly also RAF, taking encoded position from "A-5-I," at 0424. Blue Star-US Navy, PR, passing coded positions of targets with Razor 06, at 2218. Wafer 745-US Navy, probably a P-3C, troubleshooting "Alligator" (tactical data link-11), telling "5-U-Z" that he was still not "Octopus" capable (couldn't link to other players). (Perron-MD)
- 8974.0 Air Force Perth-Australian Air Force, taking position of Striker 193, probably a P-3C, at 0925. Air Force Townsville, radio check with Striker 083, probably another P-3, at 0939. (Perron-MD)
- 8983.0 CAMSLANT Chesapeake-US Coast Guard, working USCGC *Eagle*, the CG sailing vessel in the tall ship parade, at 2220. (Perron-MD)
- 8992.0 Coho 51-US Air National Guard tanker, with patch to McChord Command Post via Ascension Global, at 0105. (Perron-MD)
- 9007.0 Sentry 51-US Air Force E-3B, with a patch via Trenton Military to Raymond 24 (Tinker AFB), at 0258. (Perron-MD)
- 9016.0 Mackinaw-US military aircraft, control in the "Nightwatch" net, ultimately raised Rareness, probably WAR 46, at 0409. (Haverlah-TX)
- 9031.0 Architect-Royal Air Force headquarters, UK, with VOLMET at 2345. (Perron-MD)
- 9283.5 "November"-Control of a US Navy tracking net, working various players with single-letter identifiers, at 0326. (Sevart-KS)
- 9725.0 New Star Radio-Chinese-language "numbers" (V13), Taiwan, in powerful AM at 0900. (Yamaguchi-Japan)
- 10047.0 4XZ-Israeli Navy, Haifa (M22) with usual CW marker at 0235. (Castillo-Panama)
- 10125.0 CIO2-Mossad, Israel (E10a), with callup only at 2145. (Yamaguchi-Japan)
- 10722.0 DHJ59-German Navy, Wilhelmshaven, working DRAK (frigate *Mecklenburg-Vorp*) at 0020, DREZ (mine hunter *Bad Rappenau*) at 0023, DRAT (frigate *Emden*) at 0042, DRAN (frigate *Augsburg*) at 0051, DRHU (unid) at 0059, submarine DRDT at 0059, DRHO (tender *Donau*), and DRAH (frigate *Brandenburg*) at 0213. DHJ59 working DRAX, the sailing ship *Gorsch Fock*, which was in the Opsail 2000 tall-ship parade, at 0225. DHJ59 with submarine DRDK at 2337. (Perron-MD)
- 10780.0 Razor 66-US Air Force E-8C JSTARS aircraft, in a patch via Cape Radio to Raymond 19, Robins AFB, GA, at 1803. (Allan Stern-FL)
- 11175.0 Razor 71-US Air Force, with many phone patches to Ellsworth AFB, in Asciot 2000 exercise, most of day. (McCormick-GA)
- Navy Researcher 587-US Navy aircraft, with a patch via Andrews AFB, MD, to Eglin AB Weather, FL, at 1947. Camp Out-US military aircraft, with a patch through Andy to Offutt Meteorological, NE, at 2120. (Haverlah-TX)
- 11214.0 Sentry 33-US Air Force E-3B, with a patch via Trenton Military to Raymond 24 (Tinker AFB), at 0121. (Perron-MD)
- 11247.0 Unid-Portuguese speaker in a SELCAL check, not exactly the kind of thing usually heard on a UK Royal Air Force frequency, at 2055. (Evan Murray-NZ)
- 11430.0 New Star Radio-Chinese-language "numbers" (V13), Taiwan, in powerful AM at 0900. (Yamaguchi-Japan)
- 11494.0 Diplomat-US military, working Originate at 2316. (Sevart-KS)
- 12477.0 ELBLU-Liberian registry *M/V Banya*, with an ARQ message in English to the Torvald Klaveness Group, at 1642. (Hall-RSA)
- 12731.2 PWX33-Brazilian Navy, Rio de Janeiro, with some kind of coastal data in 100-baud FEC PacTOR, at 1640. (Hall-RSA)
- 13200.0 Reach 839T-US Air Force Air Mobility Command C-17, in patch via Thule to McGuire, at 0155. (Perron-MD)
- 13257.0 Canforce 3943-Canadian Forces aircraft, in radio check with Trenton Military, given 11232 kHz for a secondary, at 0027. (Perron-MD)
- 13530.0 Unid-US Air Force RTTY weather broadcast, location unknown, with raw output data from eastern US airport instruments, in a format not seen on this frequency before, labeled KWNO [*National Weather Service, KS -Hugh*], at 0820. (Hall-RSA)
- 13750.0 New Star Radio-Chinese-language "numbers" (V13), Taiwan, in powerful AM at 0900. (Yamaguchi-Japan)
- 13927.0 AFA1QW-US Air Force MARS, calling Reach 251T, no joy, at 1757. (Sevart-KS)
- 13965.0 AAA9USA-US Army MARS, Fort Huachuca, AZ, working AAT5TWI in 300-baud packet at 2017. (Sevart-KS)
- 13977.0 HBD-Swiss MFA, Bern, with ARQ traffic to 88 different embassies, at 1635. (Hall-RSA)
- 14648.0 4XZ-Israeli Navy, Haifa (M22), with CW marker at 0630. (Yamaguchi-Japan)
- 14750.0 CIO2-Mossad, Israel (E10a), with callup only at 1345. (Yamaguchi-Japan)
- 15016.0 Reach 6008-US Air Force Air Mobility Command, in patch to Travis AFB weather office via Andrews, at 2118. (Perron-MD)
- 15088.0 CAMSLANT Chesapeake-US Coast Guard, VA, calling "P-7-T," possible law enforcement mission, no joy, at 1441. (Perron-MD)
- 15920.0 CFH-Canadian Forces, Halifax, NS, with NAWS marker in RTTY, at 2300. (Sevart-KS)
- 15929.0 DHJ59-German Navy, in voice and RTTY checks with an unid vessel, at 1011. (Perron-MD)
- 16303.6 Unid-Probably US military intelligence training, with coded CW, ASCII, RTTY, and Sitor-B messages, at 2018. (Sevart-KS)
- 16817.5 KPH-San Francisco Radio, with Sitor-B traffic list, at 0521. (Sevart-KS)
- 17074.0 LGX-Rogaland Radio, Norway, with CW traffic list, at 2340. (Sevart-KS)
- 17423.7 KDAKRFR-Egyptian MFA, Cairo, with ARQ broadcasts to all embassies, in Arabic, at 1550. (Hall-RSA)
- 18192.2 Unid-US Coast Guard Pacific e-mail system, with 100-baud PacTOR IDs for NAQD (USCGC *Jarvis*), NLPM (USCGC *Chase*), NEPP (unknown), NMEL (USCGC *Mellon*), and NGDF (USCGC *Munro*), at 1655. (Hall-RSA) *I've also heard this system on 6961.2, 14506.2, and 20642.6. -Hugh*
- 18481.0 4XZ-Israeli Navy, Haifa (M22), with CW marker at 0648. (Yamaguchi-Japan)
- 4XZ-Israeli Navy, Haifa, with 3 CW messages in 5-letter code groups, at 1805. (Sevart-KS)
- 20086.7 WSGZKPK-Egyptian Embassy, Kinshasa, with ARQ messages to Cairo, in code and plain Arabic, at 0950. (Hall-RSA)
- 21973.7 TAD-Turkish MFA, Ankara, with FEC traffic to embassies, in Turkish, at 1300. (Hall-RSA)
- 23740.0 EZI-Mossad, Israel (E10), with callup and "numbers" message, also on 19715 and 21930kHz, at 1400. (Yamaguchi-Japan)
- 26441.7 RUCXONI 9999-Unknown station, probably NATO, with a very long, coded, ARQ message to RFFINTF (French Navy), at 1624. (Hall-RSA)



Mike Chace

mike.chace@mindspring.com

Stan Scalsky

sscalask@mail.ameritel.net

Aid Agencies on HF Radio

This month we turn the spotlight on a common inhabitant of the HF utility world, various humanitarian missions and aid agencies – usually lumped together under the term non-governmental agencies or NGOs – that spring into action at times of crisis throughout the world.

The unfortunate state of many of the world's countries mean that stations operated by these agencies tend to be on-air almost all the time. And, of course, they tend to remain in place long after the media has left for home to cover “more interesting” stories. It's a pretty good bet that any crisis that you hear about on TV or the radio these days will soon see one of the featured agencies swinging into action. All in all, they do provide some interesting fare especially for the digital utility listener.

Which NGOs are on HF?

The most common aid agencies are those operated by the United Nations (UN) itself, the UN High Commission for Refugees (UNHCR), and its various missions throughout the world. Next come the various Red Cross organizations, the International Committee of Red Cross (ICRC) and the International Federation of Red Crosses (IFRC). Also commonly heard are the Medecins sans Frontieres (MSF) or “Doctors without Borders.” The Mission Aviation Fellowship is an example of a combined privately-funded Christian ministry and aid agency providing logistics support and basic telecommunications infrastructure to poor countries. As one might expect, the majority of current activity is from Africa and the Balkans.

Many of these organizations make use of amateur (ham) radio gear since it's cheap, reliable, easy to obtain and maintain, and quick to deploy. This also means that these organizations are often found close to the ham bands – a few tens of kilohertz above or below the edges of the amateur allocation is a common hiding place. Traffic from these stations is usually easily decoded since standard ham modems are in use, but the limited power and directional antennae tend to make signals weak especially in the US.

Systems in use tend to be standard SITOR-A, PacTOR variants (Hoka decoders call these PacTOR-I1, -I2 and -U for ICRC, IFRC and UNHCR/UN respectively), and GTOR, but there has been a trend towards PacTOR-II PSK modems in recent years. AX.25 Packet Radio is sometimes used, too. The old mainstay of the UNHCR, HC-ARQ, is very rarely (if ever) heard these days. USB voice is also used by some agencies.

In most cases (especially for the UN units), stations tend to be easy to identify through their SELCALs which often contain the initial letters of the country and town. For example, the UNHCR HQ in Geneva, Switzerland, uses the SELCAL “HCSWIGE.” Others require some more investigation, but the SELCAL nearly always indicates the location. In most cases, traffic is in plain-text and the use of standard amateur mailbox (BBS) software tends to facilitate addressee identification.

Where to Listen

IFRC

Active in many troubled countries throughout the world using PacTOR-I2
Primary: 13998 kHz
Secondaries: 7810.0 9286.0 20815 kHz

ICRC

Active in many troubled countries throughout the world using PacTOR-I1.
4090.0 5144.0 6997.4 8182.6 8186.4 9356.4 10151.85 10284.0
13913.6 13963.6 13966.4 13974.4 18066.3 18066.4 20754.4 kHz

UNHCR

Active in many troubled countries throughout the world using SITOR-A, PacTOR-II PSK and PacTOR-U.
3830.0 4090.0 4091.7 5327.0 5346.0 5677.0 5752.0 8182.6 8186.4
10151.9 10175.0 11405.0 21214.0 14405.0 14478.0 19309.4 19309.6
20730.5 20734.0 kHz

St Joannis Order (aka Ordo Hospitalarius St Joannis de Deo)

Maintains operations in many West African countries linking to its HQ in Spain using PacTOR and GTOR. Locations can be determined from the SELCALs used, e.g., LOME is Lome in Togo.
14358.3 14373.3 kHz

Medecins Sans Frontieres

Maintains operations in Afghanistan, Congo, Mauritania, the Balkans, and many other countries using mostly SITOR-A and PacTOR-II.
7911.0 8186.4 10970.6 12142.7 13907.5 14421.3 14782.0 18042.1
14785.6 15688.4 18042.0 18054.6
18104.5 18526.0 19020.0 20107.0 20535.7 kHz

UN MINURSO

The United Nations Observer and Disengagement forces in Morocco (MINURSO), has the aim of separating the Moroccan and Polisario forces in Southern Morocco. Operations are in SITOR-A and MIL-188-110A PSK (with ALE heard, too).
4686.0 5005.3 6678.0 7615.0 7616.6 8186.3 8186.7 9120.0 9120.75
9120.85 kHz

Mission Aviation Fellowship

Operates in a number of African and Latin American countries including Haiti, using PacTOR with SELCALs like PAPIPO and PAPML2. Traffic is usually unencoded and zipped email from MAF's proprietary BBS system.
5427.8 5432.2 11327.8 kHz

What can you expect to hear?

The majority of traffic tends to be automated BBS to BBS transfers of email in either English, French or German. Typically one will see project status reports, supplies requisitions, inventory reconciliations (a lot of UNHCR cars apparently get stolen in Baku, Azerbaijan!) and, of course, many press reports. Most agencies format messages in a standard manner which makes sender and recipient easy to identify. Here's an example of ICRC traffic between the HQ and Kuwait office:

icrc geneva - 15.05.96 op mo desks - 96e1057
icrc koweit

for action:koweit:f.sechaud
attn : f.sechaud
refy : y/fax kow96e273
refo :
re : swap
referring to you fax kow 96e273 dated 20.04.96 concerning the fact that:
primo
you are not able to create a new reference when you swap from an application to another one, we inform you that this problem will be solved
etc etc
secundo
concerning the database “pap” which become active (keys f2 and f4 active) when you swap from thewer as soon as we receive your next backup.
best regards
monique crettol op acr mo; anouchka ciaccio op mo desks

Note the characteristic use of *primo*, *secundo*, etc. to delimit sections.

Decoder News

Checking the WinRadio website reveals plans for a very versatile looking DSP-based software decoder aimed for release about the time you read this column. The system is interesting for it appears to be the first decoder to provide true “roll your own” analysis, demodulation and decoding tools, in addition to standard modes. Initial screenshots on the website show what appears to be a very capable and flexible interface for first analyzing, then designing and launching a hand-built decoder. Both bitstream (continuous) and burst FSK (but not PSK) systems can be handled.

One disappointing feature, though: the standard modes supplied include many that are now useful only for historical purposes – ARQ6-70, SWED-ARQ and SI-FEC to name but three. How about MIL-188-141A ALE and a MIL-188-110A or STANAG4285 PSK decoder to make it a really groundbreaking product?

Resources

ICRC www.icrc.org
IFRC www.ifrc.org
UNHCR www.unhcr.ch
MSF www.msf.org
St Joannis Order
www.oh-fbf.org
Mission Aviation Fellowship
www.maf.org
WinRadio
www.winradio.com/home/fskdecoder.htm

More detailed profiles, including complete lists of SELCALs, etc., on the above can be found in the HF NGO section at Utility Monitoring Central www.mindspring.com/~mike.chace/umc.html. We'd also love to hear from any listeners with more up-to-date information on these stations and their involvement in current trouble spots.

Until next month, enjoy your listening.



Glenn Hauser, P.O. Box 1684-MT, Enid, OK 73702

E-mail: wghauser@yahoo.com

Web: www.angelfire.com/ok/worldofradio

Zimbabwe Clandestine from Secret Site

ZBC, the official network in Zimbabwe, would not report on opposition to the ruling ZANU-PF party as the June 24-25 elections approached. To break this media monopoly, Radio VOP, Voice of the People, suddenly appeared about ten days before on 7215 kHz, with two broadcasts each evening at 1700-1730 and 1915-1945 UT. But VOP also had something to hide: where was it coming from and who was behind it? Several major shortwave sites in the region have time for hire. A spokesman for SENTECH told us it was not coming from their Meyerton facilities in South Africa (though some SW transmitters are not part of SENTECH). Kai Ludwig pointed out that Ascension was too far into daylight for the early transmission, Merlin Seychelles was fully booked.

Attention soon focused on Madagascar, where Radio Netherlands' relay has a third transmitter already relaying Belgium and Tamil services (they don't like to be called clandestine) for Sri Lanka. RN's *Media Network* broadcast an informative report on the start of VOP, but never raised the question of where it was transmitted from, nor would it reply to direct questioning about RN involvement. The supposedly comprehensive RN website transmission schedule never mentioned it, but there were convenient gaps in usage where the new broadcasts would fit in nicely, before and after a relay of RVI Belgium at 1800-1900 on the 11 MHz band, as Chris Greenway pointed out.

Then RVI moved that broadcast to 7195, once a new antenna had been completed, they explained. But this also would facilitate switching at the site. Everything clicks, except that more than a month after it started, nothing had come out to confirm the transmission site as Madagascar. We can only conclude that at least one of the three parties involved did not want it to be public.

Yet, in July RN started relaying Radio Ecclésia from Holland and Madagascar to Angola (see below), and this was immediately acknowledged by Radio Nederland.

BBC Monitoring heard VOP announce: "This station is for every Zimbabwean, it belongs to no political party, it does not have to answer to any advertisers. It is your station, your views, your life and we hope that you will be entertained and informed by our programming. Our aim is to promote peace in these troubled political times and we hope that hearing many different views and many different opinions, Zimbabweans together can hope build a democratic society."

Voice of America also got into the act a week before the Zimbabwe elections, with a special daily half hour, *Zimbabwe Forum*, inserted at 1730-1800 UT via Botswana on MW 909, and on SW from São Tomé 13640 and Sri Lanka 15460. Initial funding by a grant from the Soros Foundation was extended to keep this on the air at least through July.

Angolan Station Gives Voice to Opposition

[non] R. Ecclésia, Luanda, Angola, on 15175, in an experimental SW broadcast 1900-2000, first heard in mid July; IDs as Catholic with slogan "Uma rádio para todos os angolanos". (Djaci Franklin Silva, Benevides, Pará, Brazil, *DX Listening Digest*)

As of 14 July Radio Ecclésia is relayed two hours a day by Radio Netherlands transmitters:

0500-0600 Madagascar 200 kW 15195 kHz beam 280 degrees;

1900-2000 Flevo 500 kW 15175 kHz beam 157 degrees

(Andy Sennitt, RN, *DXLD*)

The station, which came back on the air in 1997 after being silenced for many years, is a thorn in the side of the Angolan government because of its constant efforts to air uncensored news and to give a voice to political opposition within Angola.

On its 15th anniversary in 1969, a new transmitting center was inaugurated, with three mediumwave, three shortwave and two FM transmitters. But six years later, political events forced many of the Radio Ecclésia staff to flee the country. The new government nationalized or closed down the radio stations, and Radio Ecclésia was silent for nearly two decades.

In March 1997, exactly 42 years after the beginning of the regular transmissions, Radio Ecclésia was re-inaugurated in the presence of the Archbishop of Luanda, the Minister of Social Communication and other Angolan dignitaries. However, since then the station and its employees have been subjected to a great deal of official harassment because of its editorial policy.

In January 1999, the Angolan authorities issued an implicit order for a blackout of news about the civil war in the country. State media promptly responded by reducing their coverage of the war. The independent media, however, continued to report the war, and they remained the only sources of information about what was really going on. Radio Ecclésia has been forbidden on several occasions to rebroadcast the African service of the Portuguese Catholic station Radio Renascença, as its reports featured members of UNITA's leadership.

Not daring to close down Radio Ecclésia, the authorities have resorted to carrying out a campaign of threats and harassment against its personnel. On June 24, 2000, four armed men kidnapped the station's chief-editor, José Paulo. Paulo was snatched in downtown Luanda and driven out of the city limits. The kidnappers' car, however, got stuck in a bush track enabling Paulo to escape while being shot at.

Radio Ecclésia has consistently aired alternative and often dissenting views in Angola. In the days leading up to the attack on Paulo, the radio had aired an interview with vocal government critic, Rafael Marques. The radio also reported extensively on the June 21 attack on the Luanda office of the Voice of America. On the morning of June 24, Radio Ecclésia aired a live debate on the role of oil and diamonds in fueling the conflict in Angola.

The station currently broadcasts in Luanda on 97.5 MHz FM, daily at 0500-2300 UT. Broadcasts can be heard worldwide via the station's Web site <http://ecclesia.snet.co.ao/> (Andy Sennitt, Radio Nederland *Webzine*) And also one of the stations with audio links at the official site <http://www.netangola.com> (Mike Dörner, *Catholic Radio Update*)

We occasionally have fair reception of the RN relays, but the 1900 broadcast is not // the webcast (gh, OK)

AUSTRALIA Talks started in July between the ABC and the British based group, Christian Voice, on buying time for Radio Australia on the Cox Peninsula transmitters near Darwin. The group's Australian director, Mike Edmiston, said "We regard Radio Australia as a quality broadcaster. I understand that there are a few issues to be resolved for Radio Australia and between our organisations, but we're approaching that with a very positive view I guess." (ABC News Online via Matt Francis, *EDXP*) How nice for the erstwhile RA to be endorsed by the upstart CV (gh)

AUSTRIA R. Austria International budget is being slashed, so starting with B-00 season, Arabic and Esperanto will be dropped, English will be co-produced with FM-4, most German will be from domestic service, shortwave usage will be cut by 50 percent, and Moosbrunn site will sell airtime (Wolf Harranth, *ORF Intermedia* via Kai Ludwig and *VOA Communications World*)

BOLIVIA R. Mamoré, 4801v: Cumbre liaison Walt Fair in Venezuela reports R. Mamoré's daily schedule is *1000-0108/0110* UT. Antenna is folded dipole apx. 8 m high. Would like to increase height but due to airport proximity that shall be difficult (Bill Smith, *Cumbre DX*) See my article "New Bolivians on the dial" [Yura, and Mallku] at "Freeze! DXing Arctic Style": www.makelainen.com/dx/index.htm (Mika Mäkeläinen, Finland, *hard-core-dx*)

Radio Yura, 4716.8; very nice surprise in my "e-mail box": Mr. Rolando Cueto F. at canal18@cedro.pts.entelnet.bo confirms with QSL my e-mail report in 4 days, presumed address: Yura, Provincia Quijarro, Departamento de Potosí, Bolivia (Daniele Canonica, Switzerland, *DXLD*) R. Yura, 4716.7, has program for foreign listeners, *Yura, ayer y hoy*, about the isolated town. The program was dedicated to listeners in Europe and Asia every Saturday at 8 pm local time, UT Sunday 0000 (Rafael Rodríguez, Colombia, *DXLD*)

BRAZIL R. São Carlos is one of the oldest stations in the country. Its founder Gisto Rossi was one of the pioneers of radio in Brazil. However, the station has declined in the last decade, not keeping up with technological innovations. But in a recent visit to the station, in a conversation with the owner, I was informed of some interesting innovations I would like to pass on. In September, R. São Carlos will complete 60 years. Among other things, its installations are being renovated, new equipment installed, a new vitality generated. Its frequency of 2420 kHz on 120 meters will be reactivated shortly, "at any moment." It will also have a website and possibly streaming online. The big news would be the intention to transmit on 49 or 60 meters, since broadcasts on 120m these days are rather pointless, except for us DXers, of course. I was also informed that reception reports will be confirmed, especially on the occasion of the station's 60th anniversary. Let's hope so (Samuel Cássio, Brazil, *radio-escutas*, translated by gh)

Hello Mr Glenn, I'm a director of a radio group in Brazil that has stations in AM, FM and one specially in ShortWave: - Rádio Educadora de Limeira - 2380 kHz. Educadora has already been heard in European and South American countries. I want to know if you or other people ever received my station in your country. If this happens, contact me or, please, try to listen to our station. I will be very happy if this "meeting" of cultures really happens! We're waiting for your reply. Thanks, (Bruno Arcaro Bortolan, Director, Organização Bortolan Filho, bab@zaz.com.br Brazil, *WORLD OF RADIO*)

I think it has been reported in NAM, but rarely. Here's the current entry in Mark Mohrmann's list: 2379.92 BRAZIL * R Educadora, Limeira [2136-0315/0507-0637] (frequency varies .90-.98) 250 watts per *Conexión Digital*, Argentina)

Here's our reply from the director of R. Educadora de Limeira, 2380; we asked for info on the programming and SW schedule, but no info on the latter. And it seems despite the name it is not really educational, but commercial: (gh)

I am Bruno Arcaro Bortolan, Director of Bortolan Filho Organization, a Broadcast Group in São Paulo, Brazil. We have 3 radio channels: Educadora AM 1020, Educadora OT 2380 and Estereosom FM 99.9, in the city of Limeira, 150 km from São Paulo. Educadora is a popular station. We have cultural, political, Brazilian music, talk, news and sports program, with regional soccer on Sundays. We have Catholic and Evangelical programs too, but the station is private (Bruno Arcaro Bortolan, *DXLD*)

Daily around 0930 UT on 2380 kHz, I am hearing Radio Mineira do Sul, Passa Quatro MG, Brazil; this is a Harmonic 2 x 1190 (Dinan Rogério, Iracemápolis SP, Brazil, *hard-core-dx* July 7 via *DXLD*) Not to be confused with R. Educadora de Limeira fundamental (gh)

On 12209.9 Rádio Cultura Filadelfia (2 x 6105) audible almost every evening around 2320, best on June 23 with religious programs in Spanish about the family, maybe in Portuguese after 0000 (Stefan Björn, Sweden, *SW Bulletin* via Thomas Nilsson)

BURMA [non] Democratic Voice of Burma, QSLed report to the Oslo, Norway address with the site for 15600, as via Dushanbé, Tajikistan since 1997 (dvbbumra@online.no via Randy Stewart, *Cumbre DX*)

CANADA CHNX, 6130: Scott Snailham, until recently at CHNS-960/CHNX-6130 writes: at the time I left CHNS, in early May, the SW was off the air due to problems with the transmitter. Mark Olsen, CE, said he was waiting on a manual to attempt to solve the problem. I cannot say if it will ever be back on, as when I was answering QSLs it was on shaky grounds financially, and this chain is known for keeping costs tight. CHNX power, 50 watts or 500 watts? It was between 40-70 watts. I don't think they have been up to full power for years, due to the state of the transmitter (via Olle Alm, *WVWDXC Top News*)

CHINA [non] The persecuted Falung Gong sect started clandestine SW broadcasts to China,

produced in the USA, but broadcast from where? BBC has an article about their first broadcast July 1. It's at http://news.bbc.co.uk/hi/english/world/monitoring/media_reports/newsid_814000/814848.stm (Hans Johnson, *Cumbre DX*)

Due to jamming on 9915 of World Falun Dafa Radio, I only caught the ID "Shijie Falun Dafa Diantai" (Richard Lam, Singapore, *Cumbre DX*) Falun Dafa Radio at 1400-1500 on 9915 was heavily jammed by CNR-1 and CNR-2 signals starting well before the hour. No chance of hearing Falung Gong station through all this (Alan Davies, Melaka, Malaysia, *Electronic DX Press*) By July 20 Dan Ferguson and Craig Tyson report the Falun Gong station on 9370, ex 9915, at 1400-1500. Craig adds that it is heavily jammed on the new frequency. 9370 will be an even harder channel for us as it is used by WTJC in North Carolina (Hans Johnson, *Cumbre DX*) We had so little from it on 9915, that suspect the site be central Asia rather than Pacific island (gh)

COLOMBIA You may visit our website www.inravisión.com.co at the link which says Radiodifusora Nacional where you will find all the info on our station. We also want to tell you that we are changing frequency, hoping to come in with a better signal. We will be making some tests on 9655 (Janeth Jiménez M., Coordinadora Onda Corta, radiodifusora@hotmail.com via Martin Schoech, *EDXP*, translated by gh)

We did, and found the only frequency given as 11825! This seems like extremely old, rather than new info. For a long time, this has been on 4955 only. In fact, 9655 is wrong too! (gh) Radiodifusora Nacional, Bogotá, at 2045-2205, SIO 444, playing nonstop Colombian music. But the new frequency is actually 9635, not 9655 as it said; 9635 is very good atop Voz Cristiana. Earlier on 4955, heard with a weekly show on Mondays at 2200-2230 *Club de Oyentes, espacio de los radioaficionados del mundo* (Yimber Gaviria, Colombia, *DXLD*) Also heard on 9685 at 2200-0100 (Santiago San Gil, Venezuela, Club Diexistas de la Amistad)

Clandestine: Voz de la Resistencia, Bloque Oriental, 6261v back here, good at 1140-1144, poor at *2130. And Voz de la Resistencia, Comando Conjunto de Occidente, 6240, *1300-1340*, SIO 454, heard in Popayán, also IDing as Voz de la Resistencia, Cadena Bolivariana, Comando Conjunto de Occidente, transmitting here daily. Olga Lucia Marín, Comisión Internacional FARC-EP, replied by E-mail from elbarcino@laneta.apc.org with "un abrazo bolivariano." Has websites in several languages, but primarily <http://tierra.ucsd.edu/farc-ep/> and <http://burn.ucsd.edu/farc-ep/> and www.resistencianacional.org/ (Yimber Gaviria, Colombia, *DXLD*)

CONGO The first known QSL in many years came from RTV Congo Station Director Mrs. Alphonse Bouya-Dimi, for reception on 5985. Said they have Spanish news at 2100-2115. Siemens 100 kW transmitter is on 9610 at 1600-1800, then 5985 (Enzio Gehrig, Dénia, Spain, *DXLD*)

RTVC Brazzaville in Spanish heard not at announced time of 2100-2115 but at 2045-2100. It's absolutely not aired regularly at this time. Usually there's music then. Fat signal here in Central Europe! On 5985 (Thorsten Hallmann, Münster, Germany, *DXLD*)

CONGO DR [non?] Radio Télé-Liberté observed on 12925 at 1755 just before frequency change to 15725 at 1800. Clip with full ID in French is at www.intervalsignals.com (Dave Kernick, *hard-core-dx*) Quite nice clear recording, again claiming to broadcast from Gbadolité, within the DR, though some reports claim it is actually in Uganda, or at least backed by Uganda (gh)

COSTA RICA RFPI hoped to be able to start 24-hour mp3 streaming by September, thanks to the LAN and high-speed internet capability being installed and Charlie Wilkinson for supplying the software, and another donor has provided a computer to be dedicated to this (Joe Bernard, RFPI *Mailbag*) USB transmitter reactivated mid-July on new 21815, heard as late as 0330 (gh)

DOMINICAN REPUBLIC R. Barahona, 4930.05, at 0210 US baseball scores. ID "Radio Barahona Internacional presentó Deportes 12-40..."; good (Mark Mohrmann, VT, *DXLD*)

Later, on 4960.25, Radio Villa back at 0212-0240 with the same "Los 5 Grandes de la Bachata" they had before last Christmas. Very good signal. 0240 powerful carrier [HONDURAS] on 4960.0 made a mess of it (Mark Mohrmann, VT, *WORLD OF RADIO*)

ETHIOPIA [non] One of at least six clandestine stations via a DTK transmitter is R. Freedom, V. of the Ogadeni People, in Somali 1630-1700 Tue and Fri only on 15715. The Ogaden is a semi-desert area in southeast Ethiopia predominantly inhabited by ethnic Somalis, long discontented with the Ethiopian central government. The Ogaden was incorporated into the Ethiopian Empire in the 19th century and many Somalis would like to see it break away from Ethiopia and become part of Somalia. The Ogaden National Liberation Front and other rebel groups have been active in the region fighting against the Ethiopian government.

15715 is also used at other times by two other dissident outlets broadcasting via DTK facilities to Ethiopia: V. of Oromo Liberation, and V. of the Democratic Path of Ethiopian Unity.

Also via DTK is V. of Democratic Eritrea, operated by the Eritrean Liberation Front - Revolutionary Council, in Tigrina, announced as 1300-1400 Sat 6045 Eu, 1600-1700 Mon Africa 15365, and 0100-0200 UT Sun NAM 9855.

Another is Rainbow Radio ("Kestedamena Radio") in Amharic: 1600-1700 Fri 15105 Af; 0100-0200 Sat 9855 NAM; 0900-1000 Sun 5995 Eu. Full ID: "Radio Rainbow, Voice of Peace and Brotherhood" (In Amharic: "Ye Kestedamena Radio Ye Selamena Wendemamachenet Dimtse")

So, the Ethiopian/Eritrean stations currently hiring time from DTK Germany are:

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; A-00=midyear season, March 26-October 29, 2000; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

Voice of Oromo Liberation.
Voice of the Democratic Path of Ethiopian Unity.
Radio Freedom, Voice of the Ogadeni People.
Voice of Democratic Eritrea.
Voice of Ethiopian Salvation.
Rainbow Radio, Voice of Peace and Brotherhood.
(Chris Greenway, UK, *DXLD*)

FINLAND Radio Finland suspended its weekly one-hour English broadcast for the summer. Website indicated it is "on hiatus from June 25 until August." Normally at 2300-2400 UT Sat to As/ Pac, 0000-0100 Sun to Nam and 0800-0900 Sun to Eu. Radio Finland continues its daily 15 minute broadcasts (Andy Sennitt, *RN Media Newsdesk*) Indeed, nothing on 11985 or 13770 at 0000. Let's hear if they remember to resume by Sept (gh)

Scandinavian Weekend Radio's first outing, July 1 was with only 50 watts instead of 250, but was heard by a number of European DXers on 11690 alternating with 11720. Check further monthly broadcasts for 24 hours starting the night before the first Saturday, such as Sept. 1 from 2200 UT (gh)

GUATEMALA R. Verdad, 4052.47, 0220-0303*, choral church music, organ and local; S/off with long NA. Surprised they were on this late. Weak (Brian Alexander, PA, *World Of Radio*)

HONDURAS On 4960.08, HRET, at 0100 July 7, Christian religious programming in Spanish and local languages, including first Xmas message heard this season: "O Little Town of Bethlehem". Later confirmed as "R. Buenas Nuevas," full ID 0045, playing accordion-led vocal music. Used to be rare - new xmr? QRMed by the erratic Dominican with sports remote and bachata message bits on 4960.26 until its 0038 carrier drop (Jay Novello, NC, *Cumbre DX*)

IRAN [non] Radio International was first heard in late 1998 and early 1999 via WWCR. The current broadcasts, believed to be via a hired Moldovan shortwave transmitter, were first heard in November 1999. Appears based in UK. Programming has given prominence to Ali Javadi, publisher of 'Porsesh' ('Question') journal. Answerphone message also gives contact details for the UK branch of the Workers' Communist Party of Iran and its Kurdish counterpart. Tel: +44 (0)20 8962 2707; Alt Tel: +44 (0)711 461 1099; Fax: +44 (0)20 8346 2203. Schedule: 1700-1730 Daily in Persian to ME on 15550 (© BBC Monitoring)

ISRAEL Israel Radio added live RealAudio feed of some broadcasts, including English at 1030-1035 and 1900-1925. The 1400-1430 is available on demand by one hour later, leaving only the 0400-0415 net webcast. Various other services including TV news are also available. Take a look: www.israelradio.org/livestream.htm (Daniel Rosenzweig, *DXLD*)

ITALY RAI appears to have kicked up the modulation on its broadcasts in various languages on 11800 from 00 to 02 UT. English at 0050 UT has a curious charm, with announcers who usually sound as though they're in the middle of their cigarette and/or espresso and who deign to pause briefly to read a few news items at a leisurely pace, often punctuated by the sounds of rustling papers. The 20-minute English-language broadcast includes about 11 minutes of news and 9 minutes of fill music (Mike Cooper, GA, *DXLD*)

KURDISTAN Clandestine, Voice of Iraqi Kurdistan heard in Kurdish and Arabic: 0300-0700 and 1500-1900 on new 7135, ex 7095//4085 (*Observer*, Bulgaria)

LIBYA Voice of Africa at 1030-0340 on new 17725, ex-15435. No parallel. Co-channel on NF 17725: 0300-0340 VOA in English to Af; 1500-2000 VOR in Albanian, Serbian, Italian, Greek, Russian; 2000-2200 VOA in English to Af; 2300-0145 WYFR in Portuguese (*Observer*, Bulgaria)

A few days earlier, while still on 15435, English news was at 1728-1736, always co-channel QRM from Sa'udi Arabia. 2033-2038 in the clear, but muffled audio. No English heard at 2330 or 0130 (Brian Alexander, PA, *DXLD*) 1251 & 711 both remain intensely distorted signals. 1251 is massive after dark but a real struggle understanding the English news at 2040 (down to 10-20% intelligible on a clear S9 +++ signal!). Audio quality seems to vary noticeably from day to day (Steve Whitt, central Majorca, Mediumwave Circle, via NRC *International DX Digest*) Libyan audio on a certain Eutelsat bird is as bad as on SW and MW, so caused by feed circuits or studio problems (Kai Ludwig, Germany, *DXLD*)

MOLDOVA [non] Radio Moldova has reduced its broadcast time; I believe is on air only Mon-Fri, and not in Nam evenings. Printed schedule forwarded by Rikard Johansson shows English only at 1200-1225 15315 Nam, 2030-2055 7520 WEu. All via Bacau Galbeni, Romania, 120 kW (Noël Green, UK, *World Of Radio*)

MONGOLIA On the website www.mongol.net/vom/voice.ram we heard exactly the same VOM English program reported more than a month before, so they put up one foundation and left it, rather than a new one every day. What a shame (gh)

NEWFOUNDLAND CKZN (CBC), 1 kW, St. John's, 6160, relays CBN 640 AM, 1130-0406 GMT, local programming from Goose Bay studios 0830-1130. Xmr: Elcom Bauer, Antenna: Dipole with reflector aimed North to the Labrador Sea/North from St. John's, for off-shore fishermen and Labrador residents. Engineer Keith Dunford is an SWL. Address: PO Box 12010, Station A, St. John's, Newfoundland, Canada, A1B-3T8. [Don't confuse with CKZU Vancouver also on 6160 24h] Return postage is always gratefully appreciated (Joe Talbot, Alberta, *DXLD*)

NIGERIA Voice of Nigeria on new 7265 kHz (up 10 kHz) from *0500 July 11 in English. I guess they finally got tired of the interference on 7255? Some days has het, probably from SWF Germany. (David Zantow, N9EWO, WI, *DXLD*) VON actually on 7265.5 (gh)

FRNC Ibadan, 6050 at 2100 with Network News, 2135*. Fine signal sometimes and much Nigerian politics (Thorsten Hallmann, Münster, Germany, *DXLD*)

PAKISTAN R. Pakistan World Service to West Europe opens at 0800 with 3 minutes

of news in English on 21460 and 17835; and closes with English news at 1100-1104, probably the same as on 9540 in the Home Service. English can often be heard during political items or interviews during World Service transmissions, but at no regular times. Too, if/when cricket commentaries are carried, these are also partly in English. The newly combined service to the ME in Turkish 1630, Irani 1700, Arabic 1745-1830 is introducing each in English, but I have heard no other English content, on Karachi 17815 and Islamabad 11645 & 15725 (Noël Green, UK, *World Of Radio*)

PAPUA NEW GUINEA Bandscan at 1130: most unusual was R. Sandaun (Vanimo) on 3204.966 kHz. I rarely find any PNG station off frequency by more than three or four Hz. This may indicate they have a new transmitter or one in need of a calibration. Next time my cat wakes me up at this ghastly hour I will check again (Thomas B. Roach, Somewhere in the Sierra foothills, *hard-core-dx*)

PERU Radio San Antonio on 3375 is undoubtedly the same station which was on 5235.5 some years ago from San Antonio de Padua, Arequipa. It was unlicensed, operated by the Catholic church. But now it is licensed as OAW6B and is authorized by the Ministry of Transport and Communications on a frequency of 3375. Transmitter site is in the parish of San Antonio de Padua de Callalli, Arequipa. Name of the business is registered as "Centro de Medios de Comunicación Social San Antonio." According to official info, the station is also authorized another frequency, 3390 as OAW6A. Too bad this station is not heard here in Tokyo (Takayuki Inoue Nózaki, Japan, translated by gh)

Another friend, Gerardo in Perú, provides the address: Radio San Antonio, Parroquia San Antonio de Padua, Párroco Pbro. Franz Windischhofer Raffetseder, Plaza Principal s/n, Callalli, Depto. Arequipa. ID: "Es Radio San Antonio...que transmite desde la ciudad de Callalli para todos los oyentes, es una emisora católica a servicio de la comunidad"; heard at 2325-0110v* (Rogildo F. Aragão, Cochabamba, Bolivia)

New on 6672.93 is Radio Andina, at 2335-0010, huayno music and comunicados (Michael Schnitzer, Hassfurt, Germany, *hard-core-dx*) 6672.9, at 1038-1204: new Peruvian station July 8 1100 ID giving 6672 "kW", R. Andina; Manuel Campos Ojeda as Director and QTH in Calle Huascar No. 201 en Huancabamba, Piura, Perú (Rafael Rodríguez R., Bogotá, Colombia, *DXLD*) On 6673.03, Radio Andina, 0919 Andean vocals, time checks and IDs. Excellent signal. A real pleasure to listen. Hanging in there after local sunrise to 1015+. Also on 6672.94, 0220-0306*, no ads, many songs about Huancabamba. Live sign-off announcement, Peruvian NA, excellent with peaks to +20dB over (Mark Mohrmann, VT, *DXLD*)

Radio Amistad official e-mail address: radioamistad@peru.com They still use 4515 only weekends 22 to 03 UT (Spacemaster, *DXLD*)

Radio UniVisión 2000, Moyabamba, Departamento de San Martín, on 5855.62 heard since June 17 with extremely bad speech quality, music OK, starts about 1100, closing varies 0100-0300, announces 5855 (Björn Malm, Ecuador, *SW Bulletin*, translated by Thomas Nilsson) R. Univisión 2000, on 5855.7 at 0110-0140, gives location as Ciudad de Soritor, departamento de San Martín (Rafael Rodríguez, Bogotá, Colombia, *DXLD*) Radio Univisión 2000, 5855.62, Soritor, Province of Moyabamba, Department of San Martín is similar in name to R. Univisión Satélite, FM 91.3 MHz OCW9W Nueva Cajamarca, San Martín, and SW frequency is near Radio Nueva Cajamarca while active in 1999 drifting 5856.8-5860 kHz. So I think that Radio Univisión 2000 may be related to this (Takayuki Inoue Nózaki, Japan)

Radio San Juan, 5617v, Chiclayo until 0235* and *1120, new or restarted station announcing "4520 megahertz," may be the one I heard last November on 5421v (Björn Malm, Ecuador, *SW Bulletin*, translated by ed. Thomas Nilsson) Seemingly in District of Reque, Province of Chiclayo, Department of Lambayeque (Takayuki Inoue Nózaki, Tokyo, Japan, *Relámpago DX*)

Radio Cumbre, maybe new station, location unknown, Peru? heard until 0205* June 23 only on 6611.12 with nice quality, good signal and several 100% IDs (Björn Malm, Ecuador, *SW Bulletin*, translated by Thomas Nilsson)

[non] "La Resistencia Democrática Perú" is a new program on WRMI, 9955, hosted by Dr. Paul Caro, ex-Minister of Health of Peru. In the wake of presidential elections declared unfair by the OAS and the USA, this program promotes free elections and freedom of speech in Peru, UT Wed and Fri 0030-0100. Address: Programa Radial VLC, P.O. Box 836534, Miami, Florida 33283 USA. E-mail vuelvenloscondores@hotmail.com (Jeff White, WRMI, *DXLD*) No doubt the communist Cubans will let the jamming run (gh)

ROMANIA RRI 11940 put a horrible splatter spur at 0100 on 14185 in the 20m hamband, 10 over 9, not the first time such a problem occurred; the worst ugly signal problem I have observed in 25 years being a ham and SWL (Gary Froemming, AZ, *Cumbre DX*) More likely spur from //15 MHz channel (gh)

UAE R. Pinoy, heard from 1135 to 1200 in Tagalog on 17890, then closing with the Dubai national anthem (Jorge García Rangel, Venezuela, Club Dixistas de la Amistad) Previously was via Kuwait at same time on 17885 (gh)

UK BBC WS Annual Report says at least 151 megapeople now listen to the World Service every week, according to the latest global audience research. This is the World Service's biggest-ever audience, up more than eight million on the previous year. A new national study in China gave the WS weekly reach of 0.3% and showed the difficulty of building an audience there. Nearly half the Chinese people never listen to any radio. The entire document is at www.bbc.co.uk/worldservice/us/annual_report/index.shtml (via Richard Cuff, swprograms)

USA Check our new web site www.wrmi.net for details and contact info about all WRMI programming and we have a new, easier-to-remember e-mail address info@wrmi.net (Jeff White, WRMI, *DXLD*) see also PERU [non] above

Until the Next, Best of DX and 73 de Glenn!

Broadcast Logs



Gayle Van Horn

0000 UTC on 9580

SERBIA: Radio Yugoslavia. National news to station identification and mentions of Kosovo. Noted 0030, 11870 with news and text on Milosovic. (William McGuire, Cheverly, MD)

0000 UTC on 13580

CZECH REPUBLIC: Radio Prague. Political news roundup on Estonia and Iran. Segment on the Internet to local weather update and ID. (McGuire, MD) 2245, 15545 *Spotlight* segment on Czech's 14th century pavilion at Expo 2000. 2235, 11600 *Czech National Day* program. (Bob Fraser, Cohasset, MA)

0000 UTC on 9655

AUSTRIA: Radio Austria International. German. Station ID to frequency schedule quote and Internet address. Austrian politics update. (McGuire, MD; 1230 broadcast on 13730, *Week in Review*. (Fraser, MA)

0002 UTC on 4716.77

BOLIVIA: Radio Yura. Spanish. Very good signal for ID as, "ocho de la noche com nueve minutos...de la Radio Yura, la voz de la...somos en la frecuencia de 4715 kilohertz, onda corta, banda internacional de 60 metros, desde Yura, provincia...departamento de Potosi." SIO=333. (Daniele Canonica, Muggio, Switzerland)

0017 UTC on 4926

BOLIVIA: Radio San Miguel. Spanish. ID, "Buenanoche...Radio San Miguel la voz de...20 y 27 minutos.." Very low, distorted signal. (Canonica, SUI)

0030 UTC on 9855

LITHUANIA: Radio Vilnius. Musical bridge to national news. Report on *Expo 2000* and notice of upcoming book fair. (McGuire, MD)

0035 UTC on 11790

IRAN: V.O.I.R.I. Arabic. Holy Quran recitations to national and regional news updates, and text on Saudi Arabia. (McGuire, MD) 2219-2228* with historical feature to 2225. Schedule quote to southeast Asia, freq 11740 covered by WYFR at 2230. Harold Frodge, Midland, MI)

0105 UTC on 11995

FRANCE: Radio France International. World and national news to French service 0125. (Sam Wright, Biloxi, MS) 17860, 1215 newscast. (McGuire, MD) 0247-2056+, 11995. (Frodge, MI)

0200 UTC on 11885

ROMANIA: Radio Romania International. Time tips to station ID, world and regional newscast, // 11940. (McGuire, MD) English to Europe fairly audible from 2300-2359, 9690 // 11830, // 11775 // 15105. (Lee Silvi, Mentor, OH)

0235 UTC 4895

COLOMBIA: Colombia Estereo. Tropical music for Spanish ID at 0244, followed by pop tune. New station logged for me! (Mark Veldhuis, Borne, Netherlands, HCDX)

0300 UTC on 15245

SWEDEN: Radio Sweden. Frequency testing // 9495, good quality. (Silvi, OH) *Sounds Nordic* music program 1335, 18960; 1130, 18960 (Fraser, MA; Frank Hillton, Charleston, SC; Duane Hadley, Bristol, TN)

0400 UTC on 11815

BRAZIL: Radio Brasil Central. Excellent signal for jingles and Braz pops, compared to poor quality of Brazil's **Radio Banderantes** 1195. (Karl Honzik, Czech Rep./HCDX) **Radio Cultural** 4955, 2300 and **Radio Clube Rondonopolis** 4955, 2315. **Radio Difusora de Londrina** 4815, 0105-0135. (Canonica, SUI)

0400 UTC on 17675

NEW ZEALAND: Radio New Zealand International. ID, time tips to national news and report on Fiji to weather forecast. (McGuire, MD) 11720, 0955 program of classical music. (Fraser, MA)

1030 UTC on 12085

MONGOLIA: Voice of. English to 1100 into presumed Mongolian service 1100-1130. Great signal for my Ohio location! (Silvi, OH)

1204 UTC on 3345

INDONESIA: Radio Republik Indonesia-Ternate. Tentative ID for

this station with several mentions of "Jakarta," plus "Irian Jaya" and "Lombok," // 4753 for speech segment 1211-1221. Fair signal quality. RRI stations audible: **RRI-Makassar** 4753, // 3345, 1230 with "Radio Republik" noted. Tentative ID on **RRI-Serui** 1232-1243+ with Indonesian pop music; **RRI-Fak Fak** 4789, 1245-1300+, music variety program to *Song-of-the-Coconut Island* interval signal and newscast at 1300 as mentions of Banco National, covered by pulse tone. No indication of station's // 4604.4 or 4753. (Frodge, MI)

1230 UTC on 17830

TURKEY: Voice of. Weak signal for interval signal to ID and national news and *Turkish Press Review*; 13640 at 2210. (McGuire, MD) *Hues & Colors of Anatolia* 13640, 2234-2248+. Station website for station frequency schedule corrected from *Passport 2000*, <www.tsr.gov.tr/en/frequency/> (Frodge, MI) **Turkish Police Radio** 7371, 1156 with music and brief Turkish talk segment. (Zacharias Liangas, Retziki, Greece/HCDX)

1430 UTC on 5985.7

MYANMAR: Radio Myanmar. Deep fades and fair signal quality. English newscast to 1436 closing with station identification. Asian to pop music program audible to 1445. Nice to log this station, not heard daily. (Ben A. Clements, Portland, OR)

1857 UTC on 15150

INDONESIA: Voice of. Cultural program noted in German. Poor audio quality with S-9 +, closing program with Hawaiian music and IDs. Station noted 2019 with Indo pops, 15149.85. (Liangas, GRC)

1903 UTC on 15190

PHILIPPINES: Radio Pilipinas. Tagalog. Two male announcers' extensive talk on Philippines (presumed newscast) into segment on computer virus in broken English. Signal fair, improving to good S-7 quality. (Liangas, GRC)

2055 UTC on 9880

KUWAIT: Radio Kuwait. Arabic. Readings from the Koran to Arabic music. (Fraser, MA) Station noted 2100, 15505 & 2345, 11675 with announcer's chat to regional music and Islamic teaching segment. (McGuire, MD; Banks TX)

2100 UTC on 15640

ISRAEL: Kol Israel. Good signal for time tips, ID and national news. **Reshet Bet** Hebrew domestic service 9390, 0335 report on Palestinians. (McGuire, MD) Presumed log of Israel's **Galei Zahal** 2240-2305+, 6895.4. Pop music to fanfare segment at 2300. Text in Hebrew to 2302. (Frodge, MI)

2245 UTC on 5025

PERU: Radio Quillabamba. Spanish comunicados with numerous mentions of Cusco, to station identification. SINPO=24222. Peruvian's **Radio Huanta 2000**, 2300-2310 with Peruvian huayno music; **Radio La Hora** 4855.5, 2340-2345, SINPO=33222. (Michael Schnitzer, Hassfurt, Germany/HCDX) **Radio Comas** 3250.7, 0219-0233 canned ID at 0231; **Radio Horizonte** 4534.1, 0248-0253 IDs to Andean music. (Vendhuis, NLD/HCDX)

2311 UTC on 4785.3

MALI: ORTM. Tentative logging for variety mix of local languages, but no text; SIO=3+33+; // 4835. Presumed this station logged again 4835, 2311-2330+ // 4785.3, best to monitor in lower side band. **China Radio International's** Mali relay audible 2120-2128*. China features on counterfeit products, blasted by Radio Netherlands interval signal 2127 on 11730 via Antilles. Sign-off 2128. SIO=3+53. (Frodge, MI)

2325 UTC on 11700

BULGARIA: Radio Bulgaria. **History Club** segment on the nation's history of Christianity in the 6th and 7th century. (Fraser, MA) National news to station ID 0200 & 2345-2305, 11700. (McGuire, MD) Commentary on the Balkans, 2313-2320, 9400; 0038-0048+, 9400 (Frodge, MI, Banks, TX)

Thanks to our contributors — Have you sent in YOUR logs?

Send to Gayle Van Horn, c/o Monitoring Times (or e-mail gayle@webworkz.com)

English broadcast unless otherwise noted.

A closer look at Asia-Pacific station websites

With our in-depth directory on Asia-Pacific QSLing, let's focus on the station websites available on the Internet. Most Asian and Oceanic websites include multilingual links for news and information and live or downloadable audio. Program guides and schedules are available as well as a few with QSLing information and photos.

Reportedly, the most popular sites of Asia include China Radio International, All India Radio, Radio Japan, and Radio Pakistan. The unofficial sites of Mongolia, Nepal, Sri Lanka and Vietnam, contain similar information for the DXer.

Radio Republik Indonesia's network does not currently have a website; however, Nick Grace's *Indonesian Radio Web* <www.qsl.net/yb0rmi/> supplies a plethora of information from the Jakarta radio scene.

Radio Australia and Radio New Zealand represent the only two active Oceanic websites. Both are very good, with enough links to keep you interested in down under!



Let us know how your Asia-Pacific DXing goes, and good luck on QSLing this fascinating area of the world.

China Radio International <www.cri.com.cn>
 All India Radio <<http://air.kode.net/>>
 Radio Japan <www.nhk.or.jp/rjnet>
 Voice of Mongolia <www.angelfire.com/biz/mrtv/index.html>
 Radio Nepal <www.catmando.com/news/radio-nepal/radionp.htm>
 Radio Pakistan <www.radio.gov.pk/>
 FEBC Philippines <www.febc.org>
 Radio Singapore International <www.rsi.com.sg>
 SLBC Sri Lanka <www.infolanka.com/people/sisira/slbc.html>
 Radio Korea International/KBS <<http://rki.kbs.co.kr/>>
 Radio Taipan International <www.cbs.org.tw/>
 Voice of Vietnam <www.ioit.ac.vn/tieng_noi_vn/invn_int.html>
 Radio Australia <www.abc.net.au/ra/>
 Radio New Zealand <www.rnzi.com>

BHUTAN

Bhutan Broadcasting Service, 5030 kHz. Full data card and personal letter signed by Thinley Tobgay Dorji, via registered mail. Received in five weeks. Veri signers' letter credits my prepared card as the following, "thank you for designing a QSL card for us, we designed one ourselves based on yours." A subtle irony is that the stamps on the envelope commemorated the 500th anniversary of America. Station address: Department of Information & Broadcasting, Ministry of Communications, P.O. Box 101, Thimphu, Bhutan. (George Maroti, NY/*Cumbre DX*)

CHILE

Radio Voz Cristiana, 21550 kHz. Full data *Cross & Flower* logo card signed by Vanessa. Received in 14 days for an English report and a SASE (self-addressed stamped envelope). Station address: 15485 Eagle Nest Lane, Suite 220, Miami Lakes, FL 33014 USA. (Charlie F. Washburn, Robbinston, ME) Website: <www.christianvision.org/christian-vision/chile.htm>.

CHINA

China Huayi Broadcasting Corp., 4830, 4940, 6185, 11590 kHz. No data Chinese form letter unsigned, only station's official stamp. Received in one month for an English report and one U.S. dollar. Station address: P.O. Box 251, Fuzhou, Fujian 350001, China (People's Republic). (Jari Savolainen, Finland/*Hard Core DX*)

CZECH REPUBLIC

Radio Prague, 11615 kHz. *Telefunken 500* antique radio card unsigned. Received in 12 days for an English report. Station address: Vinohradska 12, 120 99 Prague, Czech Republic. (Washburn, ME) Website including Real Audio: <www.radio.cz>.

INDIA

All India Radio-Gorakhpur, 3945 kHz. Date/frequency verification letter signed by Dr. S.M. Pradhan-Superintending Engineer. Letter stated my report would be forwarded to Delhi headquarters. Received in four years after fourth follow up. Station address: Post Bag 26, Gorakhpur-273 001, Uttar Pradesh, India. (Edward Kusalik, Canada/*Cumbre DX*)

All India Radio-Simla. Full data verification letter signed by V.K. Upadhyay-Superintending Engineer, plus prepared QSL cards signed and stamped by verie signer. Verified in 50 months, including the 29 day reply by sending the report directly to the station. Station address: Choura Maidan, Simla-171 004, Himachal Pradesh, India. (Kusalik/*CDX*)

MEDIUM WAVE

KORE 1050 kHz. Full data verification at the bottom of my report, plus nice letter from Larry Knight-General Manager. This time, my new verification arrived almost to the day 32 years later! Received in seven days for an AM report. Station address: 2080 Laura St., Springfield, OR 97477. (Patrick Martin, Rancho Mirage, CA)

KTHR 1230 kHz AM. Friendly verification letter signed by George M. Malti-President, plus station bumper stickers, received for an AM report. Station address: P.O. Box 420 (or: 405-407 S. Second St., Gallup, NM 87305). (Martin, CA)

KZKR 1550 kHz AM. No data verification form letter with illegible signature. Received in 405 days for an AM report. Station address: 301 S. Polk St. # 100, Canyon, TX 79101. (Martin, CA)

WMRC, 1490 kHz. Full data prepared QSL card verified by Thomas M. McAuliffe-President, plus station brochure and business card. Received in seven days for an AM report and an SASE. Station address: 285 Main St., Milford, MA 01757. (Robert Carlson, Walpole, MA)

WSB 750 kHz AM. Full data verification on station letterhead, signed by Ryan King-Radio Engineering. Received in 185 days for an AM report and an SASE. Station address: 1601 W. Peachtree St., Atlanta, GA 30309. (Terry Jones, Plankinton, SD)

PAPUA NEW GUINEA

Radio Sandaun, 3205 kHz. Very nice partial data letter signed by Celina Korei-Station Journalist. Letter stated they left the air four days after I heard them, due to transmitter problems. Received in five weeks for a taped report and two U.S. dollars. Station address: P.O. Box 37, Vanimo, Sandau province, Papua New Guinea. (Greg Myers, VA/*CDX*) Add this to your PNG stations that could reactivate at any time. -ed.

TAJIKISTAN

Democratic Voice of Burma via Dushanbe, 15600 kHz. Data only personal letter signed by Saw Nelson Ku-Administrative Asst., plus *Free Burma* sticker, business card and station brochure. Received in 20 days for a taped report and two U.S. dollars. Transmitter sites clarified by Mr. Ku via email <dybburma@online.no>. Station address: P.O. Box 6720, St. Olavs Plass, 0130 Oslo, Norway. (Randy Stewart, Springfield, MO)

UNITED STATES

Honolulu Radio, 8828 kHz. Partial data verification on FAA letterhead, signed by Ronald L. Rayzlik. Received in 13 days for an English utility report and an SASE. Station address: FAA, Honolulu Automated Flight Service Station, 28 Lagoon Dr., Honolulu, HI 96819-1813. USA (Bill Wilkins, Springfield, MO)

WBCQ-*The Planet*, 7415 kHz. Full data color globe/logo card signed by Alan Weiner. Received in 11 days for a SASE (used for reply). Station address: 97 High St., Kennebuck, ME 04043. (Carlson, MA) Website: <<http://theplanet.wbcq.net/>>.

WYFR, 6055, 9505 kHz. Full data QSL card signed by Steffanie Y., plus religious material. Received in 21 days for an English report and a SASE. Station address: Family Stations Inc., 290 Hegenberger Rd., Oakland, CA 94621. (Carlson, MA)

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| Uniden Bearcat scanner DC cord | DCC 7 | \$15.95 |
| BP120 spare battery and charger | BAT 24 | \$25.95 |
| Alinco battery case, 4 "AA" | BAT 22 | \$9.95 |
| Alinco, car lighter cable w/filter | DCC 14 | \$23.95 |
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HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twthfa USA, Voice of America 5995am 6130ca 7405am 9455af
 ① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Savings Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on ①, then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not daily, the days of broadcast ⑤ will appear in the column following the time of broadcast, using the following codes:

Day Codes

s Sunday
 m Monday
 t Tuesday
 w Wednesday
 h Thursday
 f Friday
 a Saturday

In the same column ⑤, irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with

confirmations and reports from her monitoring team and *MT* readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas

af: Africa
 al: alternate frequency (occasional use only)
 am: The Americas
 as: Asia
 au: Australia
 ca: Central America
 do: domestic broadcast
 eu: Europe
 me: Middle East
 na: North America
 om: omnidirectional
 pa: Pacific
 sa: South America
 va: various

Consult the propagation charts.

To further help you find a strong signal, we've included a chart on page 64 which takes into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the section of the chart for the region in which you live and find the line for the region in which the station you want to hear is located. The chart indicates the optimum frequencies (in megahertz-MHz) for a given time in UTC. (Users outside North America can use the same procedure in reverse to find best reception from North America.)

Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours – space does not permit 24-hour listings. Our program manager changes the stations and programming featured each month to reflect the variety available on shortwave, though BBC programs are almost always included.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The capital letter stands for a day of the week, using the same day codes as in the frequency listing (see above), and the four digits represent a time in UTC.

MT MONITORING TEAM

Gayle Van HornFrequency Manager
gayle@webworkz.com**John Figlio**Program Manager
jfiglio1@nycap.rr.com**Mark Fine, VA**

fineware@erols.com

Jacques d'AvignonPropagation Forecasts
monitor@rac.ca**Dan Roberts, CA**

outfapress@saber.net

PROGRAM HIGHLIGHTS

JOHN FIGLIOZZI

For the first time in over a decade, there is a new name next to the title "Programming Manager" above. Yes, it is I who have the daunting task of stepping into Jim Frimmel's shoes. Jim has certainly established a high standard, but the "new management" is committed both to honoring that tradition and building on it. You can help. Tell us what you think are the strong and weak points of the Shortwave Guide. My E-mail address appears at the top of this column. Use it! If you prefer to use postal mail, write to me in care of this magazine.

News and Notes...

In July, **Radio New Zealand International** secured a one-year contract with the Kiwi commercial network, **Radio Sport**, allowing **RNZI** to – once again – broadcast sporting events to the Pacific and beyond on shortwave. So, **RNZI** is back to broadcasting its national passion, rugby, including the matches of the "All Blacks," the national team, the Super 12 League and NPC matches – as well as selected cricket and netball matches. These are likely to pop up in **RNZI**'s schedule at any time. Regular updates to the sporting schedule are posted on the **RNZI** web site <www.rnzi.com>

The Voice of America's programming – specifically its *News Now* service – was roundly criticized by the Senate Appropriations Committee in July, which expressed concern over a lack of content in VOA broadcasts explaining American "values, institutions and thought," as well as a dearth of discussion about US foreign policy.

VOA responded immediately by restoring *On the Line*, the program that until the switch to the *News Now* format discussed US foreign policy. It airs Saturdays at 0633, 1433 and 2233; and Sundays at 0233, 1033 and 1833 replacing some broadcasts of *The Best of 'Talk to America'*.

This Month...

Since the 2000 Olympics in Sydney, Australia, start on September 15, we are providing a comprehensive listing of sports-related programming in the "Selected Programs" section this month, as well as the **Radio Australia** program schedule. (Please refer to the "Programming Spotlight" column on page 69 for details about special coverage of the Olympics on **Radio Australia**. In addition, be advised that the weekend *Grandstand* sports program airs on these special frequencies only: 9660, 12080, 17580, 17715, 17750, 21725 kHz. Other frequencies carry the General English Service.)

Also, among the U.S.-based commercial shortwave broadcasters, **WBQC** "The Planet," which broadcasts from Maine, appears to be making the greatest effort to schedule interesting and diverse programs that don't readily fall into the category of radical religious or political content.

China Radio International recently made over their program schedule to provide listeners with a different theme each day. The programming follows a broader trend within international broadcasting to schedule more general magazine-style format programs.



FREQUENCIES

| | | | | | | | | | | | | | | | |
|------|------|--------|--------------------------------|---------|---------|----------|---------|--|------|------|-------|----------------------------------|---------|---------|---------|
| 0000 | 0015 | | Cambodia, National Radio Of | 11940as | | | | | 0000 | 0100 | v/a | Solomon Islands, SIBC | 9545do | | |
| 0000 | 0015 | | Japan, Radio | 6050eu | 6145eu | 6155af | 13650as | | 0000 | 0100 | | Spain, R Exterior Espana | 6055na | | |
| | | | | 17810as | | | | | 0000 | 0100 | as | UK, Global Kitchen/Merlin | 3955eu | 7325eu | |
| 0000 | 0027 | | Czech Rep, Radio Prague Intl | 11615na | 13580na | | | | 0000 | 0100 | | Ukraine, R Ukraine International | 5905eu | 6020eu | 9640eu |
| 0000 | 0030 | mtwhfa | Egypt, Radio Cairo | 9900am | | | | | | | | | 13590eu | | |
| 0000 | 0030 | | Serbia, Radio Yugoslavia | 11870na | | | | | 0000 | 0100 | | USA, Armed Forces Network | 4278am | 6458am | 12689am |
| 0000 | 0030 | | Thailand, Radio | 4830do | 6070do | 7115do | 9655af | | 0000 | 0100 | | USA, KAIJ Dallas TX | 13815va | | |
| | | | | 9690af | 11905 | | | | 0000 | 0100 | | USA, KTVB Salt Lake City UT | 15590na | | |
| 0000 | 0030 | | UK, BBC World Service | 3915as | 5965as | 5975na | 6175na | | 0000 | 0100 | | USA, KWHR Naelehu HI | 17510as | | |
| | | | | 6195as | 7110as | 9410me | 9590am | | 0000 | 0100 | twhfa | USA, Voice of America | 5995am | 6130ca | 7405am |
| | | | | 9915sa | 11945as | 11955as | 12095sa | | | | | | 9455af | 9775am | 11695ca |
| | | | | 15280as | 15310as | 15360as | 17615as | | | | | | 13740am | | |
| | | | | 17790as | | | | | 0000 | 0100 | | USA, WBCQ Monticello ME | 7415na | 9330na | |
| 0000 | 0030 | | USA, Voice of America | 7215as | 9770as | 11760as | 15185as | | 0000 | 0100 | | USA, WEWN Birmingham AL | 5825va | 13615na | |
| | | | | 15290as | 17735as | 17820as | | | 0000 | 0100 | | USA, WGTG McCaysville GA | 5085va | 6890am | |
| 0000 | 0030 | | USA, WRMI Miami FL | 9955am | | | | | 0000 | 0100 | | USA, WHRA Greenbush ME | 7580na | | |
| 0000 | 0045 | | India, All India Radio | 7410as | 9705as | 9950as | 11620as | | 0000 | 0100 | | USA, WHRI Noblesville IN | 5745na | 7315sa | |
| | | | | 13625as | | | | | 0000 | 0100 | | USA, WINB Red Lion PA | 12160am | | |
| 0000 | 0056 | | North Korea, R Pyongyang | 4405sa | 11460na | 11710na | 13760na | | 0000 | 0100 | | USA, WJCR Upton KY | 7490va | 13595as | |
| | | | | 15180na | | | | | 0000 | 0100 | | USA, WRNO New Orleans LA | 7355na | | |
| 0000 | 0100 | | Anguilla, Caribbean Beacon | 6090am | | | | | 0000 | 0100 | | USA, WSHB Cypress Crk SC | 9430na | 15285am | |
| 0000 | 0100 | vi | Australia, ABC/Alice Springs | 4835do | | | | | 0000 | 0100 | | USA, WTJC Newport NC | 9370na | | |
| 0000 | 0100 | vi | Australia, ABC/Katherine | 5025do | | | | | 0000 | 0100 | sm | USA, WWBS Macon GA | 11910eu | | |
| 0000 | 0100 | vi | Australia, ABC/Tennant Creek | 4910do | | | | | 0000 | 0100 | | USA, WWCN Nashville TN | 5070na | 7435na | 9475na |
| 0000 | 0100 | | Australia, Radio | 9660pa | 12080va | 15240pa | 17580pa | | | | | | 13845na | | |
| | | | | 17750as | 17795va | 21740va | | | 0000 | 0100 | | USA, WYFR Okeechobee FL | 6085na | 9505na | |
| 0000 | 0100 | | Canada, CBC Northern Service | 9625do | | | | | 0000 | 0100 | vi | Vanuatu, Radio | 3945do | 4960do | 7260do |
| 0000 | 0100 | | Canada, CFRX Toronto ON | 6070do | | | | | 0000 | 0100 | | Zambia, Christian Voice | 4965do | | |
| 0000 | 0100 | | Canada, CFPV Calgary AB | 6030do | | | | | 0015 | 0100 | | Iran, Radio | 6050eu | 6145na | 6155eu |
| 0000 | 0100 | | Canada, CKZU Vancouver BC | 6160do | | | | | 0030 | 0100 | | Japan, VOIRI | 9022am | 9835na | 11970na |
| 0000 | 0100 | | Costa Rica, R for Peace Intl | 6970va | 15049va | | | | 0030 | 0100 | | Lithuania, Radio Vilnius | 9855na | | |
| 0000 | 0100 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | 0030 | 0100 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 9770 | |
| | | | | 11870va | 13749af | | | | 0030 | 0100 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as |
| | | | | 9745na | 15115na | 21455usb | | | | | | | 9770as | 15425as | |
| 0000 | 0100 | | Ecuador, HCJB | 11985na | | | | | 0030 | 0100 | | Thailand, Radio | 15395na | | |
| 0000 | 0100 | s | Finland, YLE/R Finland | 13770na | | | | | 0030 | 0100 | | UK, BBC World Service | 5965as | 5975na | 6175na |
| 0000 | 0100 | | Guyana, Voice of | 3289do | 5949do | | | | | | | | 6195as | 9410as | 9590am |
| 0000 | 0100 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | | | | | 9915sa | 11955as | 12095sa |
| 0000 | 0100 | | Malaysia, Radio | 7295do | | | | | | | | | 15280as | 15310as | 15360as |
| 0000 | 0100 | | Malaysia, RTM Kota Kinabalu | 5980do | | | | | | | | | 17790as | | |
| 0000 | 0100 | | Malaysia, RTM Sarawak | 7160do | | | | | 0030 | 0100 | | USA, VOA Special English | 7215as | 9770as | 11760as |
| 0000 | 0100 | vi | Namibia, Namibian BC Corp | 3270af | 3289af | | | | | | | | 15185as | 15290as | 17735pa |
| 0000 | 0100 | | Netherlands, Radio | 6165na | 9845na | | | | | | | | 17820as | | |
| 0000 | 0100 | | New Zealand, R New Zealand Int | 17675va | | | | | | | | | | | |
| 0000 | 0100 | | New Zealand, ZLXA | 3935do | 7290do | | | | 0030 | 0100 | twhfa | USA, WRMI Miami FL | 7385na | | |
| 0000 | 0100 | vi | Papua New Guinea, NBC | 9675do | 11880do | | | | 0030 | 0100 | sm | USA, WRMI Miami FL | 3955am | | |
| 0000 | 0100 | | Singapore R Corp of Singapore | 6150do | | | | | 0050 | 0100 | | Italy, RAI International | 6010na | 9675na | 11800na |
| 0000 | 0100 | vi/as | Solomon Islands, SIBC | 5020do | | | | | 0050 | 0100 | | UK, International BC Tamil | 11570as | | |

SELECTED PROGRAMS

Daily

| | |
|------|---|
| 0000 | R. Australia: News |
| 0020 | UK, BBCWS E. As/Aus/Pac stream: Sports Roundup (British/world reports/scores) |
| 0020 | UK, BBCWS S. Asia stream: Sports Roundup (British/world reports/scores) |
| 0030 | USA, VOA Special English: News |

Sunday

| | |
|------|---|
| 0000 | USA, VOA News Now: World News |
| 0000 | USA, WBQC: A Different Kind of Oldies Show |
| 0010 | R. Australia: Correspondents' Report (round-up of global stories) |
| 0010 | USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting) |
| 0014 | USA, VOA News Now: US News |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0020 | UK, BBCWS Americas stream: Sports Roundup (British/world reports/scores) |
| 0022 | USA, VOA News Now: US feature (a report about the US) |
| 0030 | R. Australia: Carving Out (13-part series on Pacific development) |
| 0040 | USA, VOA Special English: Words and Their Stories (etymology) |
| 0045 | USA, VOA Special English: 20th Century Americans (important people of the century) |

Monday

| | |
|------|--|
| 0000 | USA, VOA News Now: World News |
| 0000 | USA, WBCQ: Radio New York International (musical variety with Johnny Lightning)[to 0400] |
| 0010 | R. Australia: Correspondents' Report (round-up of global stories) |
| 0010 | USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting) |

| | |
|------|---|
| 0014 | USA, VOA News Now: US News |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0020 | UK, BBCWS Americas stream: Sports Roundup |
| 0022 | USA, VOA News Now: US feature (a report about the US) |
| 0025 | R. New Zealand Int.: Sport (brief round-up) |
| 0030 | R. Australia: Health Report |
| 0040 | USA, VOA Special English: Development Report (aid and assistance) |
| 0045 | USA, VOA Special English: This Is America (life in the US) |

Tuesday

0000 USA, WBCQ: London Calling (British rock)
0030 R. Australia: Law Report (the Australian legal profession/courts)
0040 USA, VOA Special English: Agriculture Today (brief farming report)
0045 USA, VOA Special English: Science in the News (latest developments in science)

Tuesday-Friday

0025 R. New Zealand Int.: Sport (brief round-up)
0045 USA, VOA News Now: Science, Medicine and the Environment
0049 USA, VOA News Now: Business and Economic News
0054 USA, VOA News Now: Music feature

Tuesday-Saturday

| | |
|------|---|
| 0000 | USA, VOA News Now: World News |
| 0010 | R. Australia: Asia Pacific (regional current events analysis) |
| 0010 | USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting) |
| 0014 | USA, VOA News Now: US News |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0018 | USA, VOA News Now: Sports (reports/scores) |
| 0022 | USA, VOA News Now: US feature (a report about the US) |

| | | | | | | |
|------|------|-------|----------------------------------|---------|---------|---------|
| 0000 | 0100 | v/a | Solomon Islands, SIBC | 9545do | | |
| 0000 | 0100 | | Spain, R Exterior Espana | 6055na | | |
| 0000 | 0100 | as | UK, Global Kitchen/Merlin | 3955se | 7325eu | |
| 0000 | 0100 | | Ukraine, R Ukraine International | 5905se | 6020eu | 9640eu |
| | | | | 13590eu | | |
| 0000 | 0100 | | USA, Armed Forces Network | 4278am | 6458am | 12689am |
| 0000 | 0100 | | USA, KAIL Dallas TX | 13815va | | |
| 0000 | 0100 | | USA, KTNB Salt Lake City UT | 15590na | | |
| 0000 | 0100 | | USA, KWHR Naalehu HI | 17510as | | |
| 0000 | 0100 | twfha | USA, Voice of America | 5995am | 6130ca | 7405am |
| | | | | 9455af | 9775am | 11695ca |
| | | | | 13740am | | |
| 0000 | 0100 | | USA, WBCQ Monticello ME | 7415na | 9330na | |
| 0000 | 0100 | | USA, WVEN Birmingham AL | 5825va | 13615na | |
| 0000 | 0100 | | USA, WGTG McCaysville GA | 5085va | 6890am | |
| 0000 | 0100 | | USA, WHRA Greenbush ME | 7580na | | |
| 0000 | 0100 | | USA, WHRI Noblesville IN | 5745na | 7315sa | |
| 0000 | 0100 | | USA, WINB Red Lion PA | 12160am | | |
| 0000 | 0100 | | USA, WJCR Upton KY | 7490va | 13595as | |
| 0000 | 0100 | | USA, WRNO New Orleans LA | 7355na | | |
| 0000 | 0100 | | USA, WSHB Cypress Crk SC | 9430na | 15285am | |
| 0000 | 0100 | | USA, WTJC Newport NC | 9370na | | |
| 0000 | 0100 | sm | USA, WWBS Macon GA | 11910eu | | |
| 0000 | 0100 | | USA, WWCR Nashville TN | 5070na | 7435na | 9475na |
| | | | | 13845na | | |
| 0000 | 0100 | | USA, WYFR Okeschobee FL | 6085na | 9505na | |
| 0000 | 0100 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do |
| 0000 | 0100 | | Zambia, Christian Voice | 4965do | | |
| 0015 | 0100 | | Japan, Radio | 6050eu | 6145na | 6155eu |
| 0030 | 0100 | | Iran, VOIRI | 9022am | 9835na | 11970na |
| 0030 | 0100 | | Lithuania, Radio Vilnius | 9855na | | |
| 0030 | 0100 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 9770 | |
| 0030 | 0100 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as |
| | | | | 9770as | 15425as | |
| 0030 | 0100 | | Thailand, Radio | 15395na | | |
| 0030 | 0100 | | UK, BBC World Service | 5965as | 5975na | 6175na |
| | | | | 6195as | 9410as | 9590am |
| | | | | 9915sa | 11955as | 12095sa |
| | | | | 15280as | 15310as | 15360as |
| | | | | 17790as | | |
| 0030 | 0100 | | USA, VOA Special English | 7215as | 9770as | 11760as |
| | | | | 15185as | 15290as | 17735pa |
| | | | | 17820as | | |
| 0030 | 0100 | twfha | USA, WRMI Miami FL | 7385na | | |
| 0030 | 0100 | sm | USA, WRMI Miami FL | 3955am | | |
| 0050 | 0100 | | Italy, Rai International | 6010na | 9675na | 11800na |
| 0050 | 0100 | | UK, International BC Tamil | 11570as | | |

Wednesday

0000 USA, WBCQ: Off the Hook (Pacifica Network current affairs)
0030 R. Australia: Religion Report (Australian spiritual life)
0040 USA, VOA Special English: Science Report
0045 USA, VOA Special English: Explorations (reports on space/stars/
human body)

Thursday

0000 USA, WBCQ: Idio-Audio (audio oddities)
0030 R. Australia: Media Report (how the media operate)
0040 USA, VOA Special English: Science Report
0045 USA, VOA Special English: Making of a Nation (US history)

Friday

0000 USA, WBCQ: Radio Detective (discussion about antique radios)
0030 R. Australia: The Sports Factor
0030 R. Australia: The Sports Factor
0040 USA, VOA Special English: Environment Report
0045 USA, VOA Special English: American Mosaic (student life/popular culture)

Saturday

0000 USA, WBCQ: Allan Weiner Worldwide
0030 R. Australia: Feedback (listener letters/station news)
0033 USA, VOA News Now: Press Conference USA (w/American/foreign correspondents)
0040 USA, VOA Special English: In the News (explanation of a current event or personality)
0045 USA, VOA Special English: American Stories



FREQUENCIES

| | | | | | | | | | | |
|--------------|------------------------------------|---------|---------|-----------------|-----------------|----------------------------------|---------|---------|---------|---------|
| 0100 0110 | Italy, RAI International | 6010na | 9675na | 11800na | 0100 0200 | Singapore R Corp of Singapore | 6150do | | | |
| 0100 0115 | Finland, YLE/R Finland | 11985na | 13770na | | 0100 0200 vl/as | Solomon Islands, SIBC | 5020do | | | |
| 0100 0125 | Croatia, Croatian Radio | 9925na | | | 0100 0200 vl/a | Solomon Islands, SIBC | 9545do | | | |
| 0100 0127 | Czech Rep, Radio Prague Intl | 7345na | 11615na | | 0100 0200 | Spain, R Exterior Espana | 6055na | | | |
| 0100 0127 | Vietnam, Voice of | 7250na | 9695na | | 0100 0200 | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as | 9770as |
| 0100 0130 | Canada, R Canada International | 5960am | 9755am | 11715am 13670am | | | 15425as | | | |
| | | 15170am | 15305am | | 0100 0200 | UK, BBC World Service | 5965as | 5975na | 6175na | 6195as |
| 0100 0130 s | Germany, Universal Life | 9435as | | | | | 9410me | 9590am | 9915sa | 11955as |
| 0100 0130 | Hungary, Deutsche Budapest | 9560na | | | | | 12095sa | 15280as | 15310as | 15360as |
| 0100 0130 | Iran, VOIRI | 9022am | 9835ca | 11970na | | | 17790as | | | |
| 0100 0130 | Netherlands, Radio | 6165na | 9845na | | 0100 0200 | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 0100 0130 | Slovakia, R Slovakia International | 5930na | 7230ca | 9440sa | 0100 0200 | USA, KAIJ Dallas TX | 13815va | | | |
| 0100 0130 | Switzerland, Swiss R International | 9885am | 9905am | | 0100 0200 | USA, KJES Vado NM | 7555na | | | |
| 0100 0130 | USA, Voice of America | 5995am | 6130ca | 7405am 9455af | 0100 0200 | USA, KTBN Salt Lake City UT | 7510na | | | |
| | | 9775am | 13740am | | 0100 0200 | USA, KWHR Naalehu HI | 17510as | | | |
| 0100 0130 | Uzbekistan, Radio Tashkent | 7190as | 9375as | 9530as 9715as | 0100 0200 | USA, Voice of America | 7115as | 9635as | 11705as | 11725as |
| 0100 0145 | Germany, Deutsche Welle | 6040na | 9640am | 11810na 13720am | | | 11820as | 13650as | 15250as | 17740as |
| 0100 0156 | China, China Radio International | 9570na | | | | | 17820as | | | |
| 0100 0156 | North Korea, R Pyongyang | 3560va | 11735va | 15229va 17734va | 0100 0200 | USA, WBCQ Monticello ME | 7415na | 9330na | | |
| 0100 0200 | Anguilla, Caribbean Beacon | 6090am | | | 0100 0200 | USA, WEWN Birmingham AL | 5825na | 13615na | | |
| 0100 0200 vl | Australia, ABC/Katherine | 5025do | | | 0100 0200 | USA, WGTG McCaysville GA | 5085va | 6890am | | |
| 0100 0200 vl | Australia, ABC/Tennant Creek | 4910do | | | 0100 0200 | USA, WHRA Greenbush ME | 7580na | | | |
| 0100 0200 | Australia, Radio | 9660pa | 12080va | 15240pa 15415as | 0100 0200 | USA, WHRI Noblesville IN | 5745na | 7315sa | | |
| | | 17580pa | 17750as | 21725pa | 0100 0200 | USA, WINB Red Lion PA | 12160am | | | |
| 0100 0200 | Canada, CBC Northern Service | 9625do | | | 0100 0200 | USA, WJCR Upton KY | 7490va | 13595as | | |
| 0100 0200 | Canada, CFRX Toronto ON | 6070do | | | 0100 0200 twhfa | USA, WRMI Miami FL | 7385na | | | |
| 0100 0200 | Canada, CFVP Calgary AB | 6030do | | | 0100 0200 sm | USA, WRMI Miami FL | 9955am | | | |
| 0100 0200 | Canada, CKZN St John's NF | 6160do | | | 0100 0200 | USA, WRNO New Orleans LA | 7355na | | | |
| 0100 0200 | Canada, CKZU Vancouver BC | 6160do | | | 0100 0200 | USA, WSHB Cypress Crk SC | 9430na | 15285am | | |
| 0100 0200 | Costa Rica, R for Peace Intl | 6970va | 15049va | | 0100 0200 | USA, WTJC Newport NC | 9370na | | | |
| 0100 0200 | Costa Rica, University Network | 5030am | 6150va | 7375na 9725na | 0100 0200 sm | USA, WWBS Macon GA | 11900eu | | | |
| | | 11870va | 13749af | | 0100 0200 | USA, WWCN Nashville TN | 3215na | 5070na | 7435na | 13845na |
| 0100 0200 | Cuba, Radio Havana | 6000na | 9820na | 11705na | 0100 0200 | USA, WYFR Okeechobee FL | 6065na | 15165as | | |
| 0100 0200 | Ecuador, HCJB | 9745na | 15115na | 21455 usb | 0100 0200 vl | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 0100 0200 | Guyana, Voice of | 3289do | 5949do | | 0100 0200 | Zambia, Christian Voice | 4965do | | | |
| 0100 0200 | Indonesia, Voice of | 9525va | 11785va | 15149va | 0130 0145 VL | Libya, Voice of Africa | 11815af | 15415af | 17725va | |
| 0100 0200 as | Italy, IRRS | 7120va | | | 0130 0159 | Canada, R Canada International | 5960am | 9755am | | |
| 0100 0200 | Japan, Radio | 9515me | 11860as | 11870me 15325as | 0130 0159 sm | Canada, R Canada International | 11715am | 13670am | 15305am | |
| | | 15590as | 17685pa | 17835sa 17845pa | 0130 0200 | Austria, R Austria International | 9655na | 9870am | 13730am | |
| 0100 0200 | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | 0130 0200 | Slovakia, Adventist World Radio | 11600as | | | |
| 0100 0200 | Malaysia, Radio | 7295do | | | 0130 0200 | Sweden, Radio | 13625as | | | |
| 0100 0200 | Malaysia, RTM Kota Kinabalu | 5980do | | | 0130 0200 | UK, RTE Radio | 6155am | | | |
| 0100 0200 | Namibia, Namibian BC Corp | 3270af | 3289af | | 0130 0200 twhfa | USA, VOA Special English | 7405am | 9775am | 13740am | |
| 0100 0200 | New Zealand, R New Zealand Int | 17675va | | | 0130 0200 twhfa | USA, Voice of America | 5995as | 6130ca | 9455af | |
| 0100 0200 | New Zealand, ZLXA | 3935do | 7290do | | 0140 0200 | Vatican City, Vatican Radio | 9650au | 12055au | | |
| 0100 0200 vl | Papua New Guinea, NBC | 9675do | 11880do | | 0145 0200 | Albania, R Tirana International | 6115na | 7160na | | |
| 0100 0200 | Russia, Voice of Russia WS | 9665na | 11990na | 11990na 12045as | | | | | | |
| | | 15595na | 17595na | | | | | | | |

SELECTED PROGRAMS

Daily

- 0100 R. Australia: News
0130 USA, VOA News Now: World News

Sunday

- 0100 USA, WBCQ: Marion's Attic (vintage recordings/stories)
0105 R. Australia: The Europeans (political/cultural/economic/social developments in Europe)
0133 USA, VOA News Now: Issues in the News (discussions w/Washington press)

Sunday-Monday

- 0100 USA, VOA News Now: World News
0110 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
0114 USA, VOA News Now: US News
0118 USA, VOA News Now: Sports (reports/scores)
0118 USA, VOA News Now: Sports (reports/scores)
0122 USA, VOA News Now: US feature (a report about the US)
0130 Ireland, RTE: Sportsnews (weekend roundup from Ireland, RTE-I domestic network)

Monday

- 0100 USA, WBCQ: Radio New York International (musical variety)[cont'd from 0000]
0110 R. Australia: AWAYE! (Australian indigenous affairs)
0136 USA, VOA News Now: Dateline (news background/analysis)
0145 USA, VOA News Now: Science, Medicine and the Environment
0149 USA, VOA News Now: Business and Economic News
0154 USA, VOA News Now: General feature report (a topical report)

Tuesday

- 0110 R. Australia: Science Show (science Australia and abroad)
0140 USA, VOA Special English: Agriculture Today (brief farming report)
0145 R. Sweden: Sportskan (reports/scores of events in Scandinavia)
0145 USA, VOA Special English: Science in the News (latest developments in science)

Tuesday-Friday

- 0100 USA, WBCQ: Overcomer Ministry (Brother R. G. Stair preaches)
0136 USA, VOA News Now: Dateline (news background/analysis)
0145 USA, VOA News Now: Science, Medicine and the Environment
0149 USA, VOA News Now: Business and Economic News
0154 USA, VOA News Now: General feature report (a topical report)

Tuesday-Saturday

- 0100 USA, VOA News Now: World News
0110 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
0114 USA, VOA News Now: US News
0118 USA, VOA News Now: Sports (reports/scores)
0118 USA, VOA News Now: Sports (reports/scores)
0122 USA, VOA News Now: US feature (a report about the US)
0130 USA, VOA News Now: World News
0130 USA, VOA Special English: News (in special English)
0135 R. Habana Cuba: Time Out (Cuban sports)

Wednesday

- 0105 UK, BBCWS Mideast/CIS stream: Focus on Football (how soccer is developing globally)[Sust wk.]
0105 UK, BBCWS Mideast/CIS stream: Sports International (issues/people behind headlines)[exc. Sust wk.]
0110 R. Australia: National Interest (the week's main issues in Australia)

- 0120 R. Slovakia Int.: Sports (weekly report)
0140 USA, VOA Special English: Science Report
0145 USA, VOA Special English: Explorations (reports on space/stars/human body)

Thursday

- 0105 UK, BBCWS Americas stream: Sports International (issues/people behind headlines)[exc. Sust wk.]
0105 UK, BBCWS Americas stream: Focus on Football (how soccer is developing globally)[Sust wk.]
0110 R. Australia: Background Briefing (current affairs in depth)
0140 USA, VOA Special English: Science Report
0145 USA, VOA Special English: Making of a Nation (US history)

Friday

- 0110 R. Australia: Hindsight (current events from an historical perspective w/Michelle Rayner)
0130 Germany, Deutsche Welle: Spotlight on Sport (sports report)
0140 USA, VOA Special English: Environment Report
0145 USA, VOA Special English: American Mosaic (student life/popular culture)

Saturday

- 0100 USA, WBCQ: Adventures in Popular Music
0105 R. Australia: Oz Sounds (Australian music/performers)
0130 R. Australia: Arts Talk (cultural current events)
0133 USA, VOA News Now: Communications World (worldwide broadcast/electronic media w/Kim Elliot)
0140 USA, VOA Special English: In the News (explanation of a current event or personality)
0145 USA, VOA Special English: American Stories (short stories by American authors)



FREQUENCIES

| | | | | | | | | | | | | | | | | | |
|------|------|---------|----------------------------------|---------|---------|----------|---------|--|------|------|-------|---------------------------------|---------|---------|---------|---------|--|
| 0200 | 0210 | | Bangladesh, Bangla Betar | 4882as | | | | | 0200 | 0300 | | Singapore R Corp of Singapore | 6150do | | | | |
| 0200 | 0210 | mtwhf | Greece, Voice of | 7450va | 9420va | 12110va | 15630va | | 0200 | 0300 | vl/as | Solomon Islands, SIBC | 5020do | | | | |
| 0200 | 0229 | | Canada, R Canada International | 9755am | 11715am | 13670am | 15170am | | 0200 | 0300 | vl/a | Solomon Islands, SIBC | 9545do | | | | |
| | | | | 15305am | | | | | 0200 | 0300 | | South Korea, R Korea Intl | 7275as | 11725sa | 11810sa | 15575na | |
| 0200 | 0230 | sm w fa | Belarus, Radio Minsk | 7210va | 11670va | | | | 0200 | 0300 | | Sri Lanka, Sri Lanka BC Corp | 6005as | 6075as | 6130do | 9770as | |
| 0200 | 0230 | | Myanmar, Radio | 7185do | | | | | | | | | 15425as | | | | |
| 0200 | 0230 | a | UK, Wales Radio Intl/Merlin | 9765na | | | | | 0200 | 0300 | | Taiwan, R Taiwan International | 5950na | 9680na | 11740as | 11825pa | |
| 0200 | 0230 | | USA, KJES Vado NM | 7555na | | | | | | | | | 15345as | | | | |
| 0200 | 0230 | | USA, WINB Red Lion PA | 12160am | | | | | | | | UK, BBC World Service | 5975na | | 6175na | 6195eu | |
| 0200 | 0245 | | Germany, Deutsche Welle | 9615as | 11945as | 11965as | | | 0200 | 0300 | | | 9410eu | 9770af | 9915sa | 11760me | |
| 0200 | 0256 | | North Korea, R Pyongyang | 11844va | 13649va | | | | | | | | 11955as | 12095sa | 15280as | 15310as | |
| 0200 | 0256 | | Romania, R Romania International | 9510na | 9690na | 11830na | 11885as | | | | | | 15360as | 17790as | | | |
| | | | | 11940na | 15105as | 15380pa | 17790pa | | 0200 | 0300 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | | |
| 0200 | 0300 | | Anguilla, Caribbean Beacon | 6090am | | | | | 0200 | 0300 | | USA, KAJI Dallas TX | 5755va | | | | |
| 0200 | 0300 | twfha | Argentina, RAE | 11710am | | | | | 0200 | 0300 | | USA, KTVN Salt Lake City UT | 7510na | | | | |
| 0200 | 0300 | vl | Australia, ABC/Alice Springs | 4835do | | | | | 0200 | 0300 | | USA, KWHR Naalehu HI | 17510as | | | | |
| 0200 | 0300 | vl | Australia, ABC/Katherine | 5025do | | | | | 0200 | 0300 | | USA, Voice of America | 7115as | 9635as | 11705as | 11725as | |
| 0200 | 0300 | vl | Australia, ABC/Tennant Creek | 4910do | | | | | | | | | 11820as | 13650as | 15250as | 17740as | |
| 0200 | 0300 | | Australia, Radio | 9660pa | 12080va | 15240pa | 15415as | | | | | | 17820as | | | | |
| | | | | 15515va | 17580pa | 17750as | 21725pa | | 0200 | 0300 | | USA, WBCQ Monticello ME | 7415na | 9330na | | | |
| 0200 | 0300 | | Bulgaria, Radio | 9400na | | | | | 0200 | 0300 | | USA, WEWN Birmingham AL | 5825va | | | | |
| 0200 | 0300 | | Canada, CBC Northern Service | 9625do | | | | | 0200 | 0300 | | USA, WGTG McCaysville GA | 5085va | 6890am | | | |
| 0200 | 0300 | | Canada, CFRX Toronto ON | 6070do | | | | | 0200 | 0300 | | USA, WHRA Greenbush ME | 7580na | | | | |
| 0200 | 0300 | | Canada, CFVP Calgary AB | 6030do | | | | | 0200 | 0300 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | | |
| 0200 | 0300 | | Canada, CKZN St John's NF | 6160do | | | | | 0200 | 0300 | | USA, WJCR Upton KY | 7490va | 13595as | | | |
| 0200 | 0300 | | Canada, CKZU Vancouver BC | 6160do | | | | | 0200 | 0300 | | USA, WRMI Miami FL | 7385na | | | | |
| 0200 | 0300 | | Costa Rica, R for Peace Intl | 6970va | 15049va | | | | 0200 | 0300 | | USA, WRNO New Orleans LA | 7355na | | | | |
| 0200 | 0300 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | 0200 | 0300 | | USA, WSHB Cypress Crk SC | 7535na | 9430na | | | |
| | | | | 11870va | 13749af | | | | 0200 | 0300 | | USA, WTJC Newport NC | 9370na | | | | |
| 0200 | 0300 | | Cuba, Radio Havana | 6000na | 9820na | 11705na | | | 0200 | 0300 | | USA, WWCR Nashville TN | 3215na | 5070na | 5935na | 7435na | |
| 0200 | 0300 | | Ecuador, HCJB | 9745na | 15115na | 21455usb | | | 0200 | 0300 | | USA, WYFR Okeechobee FL | 6065na | 9505na | | | |
| 0200 | 0300 | | Egypt, Radio Cairo | 9475am | | | | | 0200 | 0300 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | | |
| 0200 | 0300 | | Guyana, Voice of | 3289do | 5949do | | | | 0200 | 0300 | | Zambia, Christian Voice | 4965do | | | | |
| 0200 | 0300 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | 0200 | 1215 | | Cambodia, National Radio Of | 11940as | | | | |
| 0200 | 0300 | | Malaysia, Radio | 7295do | | | | | 0215 | 0220 | | Nepal, Radio | 5005as | 7165as | | | |
| 0200 | 0300 | | Malaysia, RTM Kota Kinabalu | 5980do | | | | | 0230 | 0257 | | Vietnam, Voice of | 7250na | 9695na | | | |
| 0200 | 0300 | | Namibia, Namibian BC Corp | 3270af | 3289af | | | | 0230 | 0300 | | Albania, R Tirana International | 6115na | 7160na | | | |
| 0200 | 0300 | | New Zealand, R New Zealand Int | 17675va | | | | | 0230 | 0300 | | Hungary, Radio Budapest | 9835na | | | | |
| 0200 | 0300 | | New Zealand, ZLXA | 3935do | 7290do | | | | 0230 | 0300 | | Sweden, Radio | 9495na | | | | |
| 0200 | 0300 | vl | Papua New Guinea, NBC | 9675do | 11880do | | | | 0250 | 0300 | | Vatican City, Vatican Radio | 7305am | 9605am | | | |
| 0200 | 0300 | | Russia, Voice of Russia WS | 9665na | 11990na | 13690na | 15595na | | 0250 | 0300 | vl | Zambia, National BC Corp | 6165do | 6265do | | | |
| | | | | 17595na | | | | | 0257 | 0300 | vl | Malawi, Malawi BC Corp | 3380do | | | | |

SELECTED PROGRAMS

Daily

| | | |
|------|-------------------|--|
| 0200 | R. Australia | News |
| 0200 | USA, VOA News Now | World News |
| 0210 | USA, VOA News Now | Regional News (news from the regions to which VOA is broadcasting) |
| 0214 | USA, VOA News Now | US News |
| 0218 | USA, VOA News Now | Sports (reports/scores) |
| 0218 | USA, VOA News Now | Sports (reports/scores) |
| 0222 | USA, VOA News Now | US feature (a report about the US) |
| 0230 | USA, VOA News Now | World News |

Sunday

| | | |
|------|-------------------|---|
| 0200 | USA, WBCQ | Here Now |
| 0205 | R. Australia | Fine Music Australia (Australian classical music compositions/performers) |
| 0230 | R. Australia | Innovations (inventions/new practices) |
| 0233 | USA, VOA News Now | On the Line (US foreign policy discussed) |
| 0254 | USA, VOA News Now | General feature report (a topical report) |

Monday-Friday

| | | |
|------|-------------------|---|
| 0200 | USA, WBCQ | Radio New York International (musical variety)(cont'd from 0000) M only |
| 0210 | R. Australia | The World Today (relay of domestic current affairs program) |
| 0245 | USA, VOA News Now | Science, Medicine and the Environment |
| 0249 | USA, VOA News Now | Business and Economic News |
| 0254 | USA, VOA News Now | Music feature |

Tuesday

0220 R. Bulgaria Sports (weekend results in Europe/Bul-
garia)

| | | |
|------|---------------------------|---|
| 0245 | R. Sweden Scandinavia) | Sportscan (reports/scores of events in |
| 0200 | USA, WBCQ Tu-Fri | Hour of the Time (anti-gun control program) |

Friday

| | | |
|------|---|----------------------------|
| 0230 | Germany, Deutsche Welle sports report) | Spotlight on Sport (weekly |
|------|---|----------------------------|

Saturday

| | | |
|------|-------------------|--|
| 0200 | R. Australia | Grandstand (live sports action)[to 0800] |
| 0200 | R. Australia | Grandstand (live sports action)[to 0800] |
| 0200 | USA, WBCQ | The Right Perspective (conservative political comment/phone-in) [live to 0400] |
| 0205 | R. Australia | Ockham's Razor (science issues) |
| 0230 | R. Australia | Earthbeat (regional environmental issues) |
| 0233 | USA, VOA News Now | Best of 'Talk to America' (highlights from daily phone-in) |

Hauser's Highlights

INDIA: All India Radio

AIR has new 250 kW SW transmitter from Delhi.

Includes English:

116202045-2230

GOS-V

Au/NZ:

EAF replacing 15075

(Alok Dasgupta, India, WWDXC *Top News*)

11620 had been good for us before the beam

was changed from Eu to Au/NZ

(Joe Hanlon, PA)

Hauser's Highlights

SAIPAN: KFBS on 12160

It was WWCR which initially got 12160 cleared with the FCC for broadcast usage; but that does not give it any exclusive claim to it, and more FCC-licensed stations have been using it. KFBS is one, and is even using it at the same time as WWCR, causing interference to WWCR in WNAm. BBCM issued the KFBS sked, from which we extract 12160 in use at 1300-1530: (gh)

| | | |
|-----------|-----------------|-------------------|
| 1300-1400 | Daily | VIETNAMESE |
| 1400-1430 | Thu | MIEN |
| 1400-1430 | Sun | KOHO (to Vietnam) |
| 1400-1430 | Wed | HMONG |
| 1400-1430 | Mon/Tue/Fri/Sat | VIETNAMESE |
| 1430-1530 | Daily | URMESE |

((c) BBC Monitoring)



FREQUENCIES

| | | | | | | | | | | | | | |
|------|------|---------------------------------|---------|---------|----------|------|------|------|----------------------------------|---------|---------|---------|---------|
| 0300 | 0310 | Vatican City, Vatican Radio | 7305am | 9605am | | 0300 | 0400 | v/as | Solomon Islands, SIBC | 5020do | | | |
| 0300 | 0325 | Croatia, Croatian Radio | 9925na | | | 0300 | 0400 | v/a | Solomon Islands, SIBC | 9545do | | | |
| 0300 | 0327 | Czech Rep, Radio Prague Intl | 7345na | 7385na | 11615na | 0300 | 0400 | | Sri Lanka, Sri Lanka BC Corp | 6005as | 6075as | 6130do | 9770as |
| 0300 | 0330 | Egypt, Radio Cairo | 9475am | | | | | | | 15425as | | | |
| 0300 | 0330 | S Africa, Adventist World Radio | 6015af | | | 0300 | 0400 | | Taiwan, R Taiwan International | 5950na | 9680na | 11745as | 11825as |
| 0300 | 0330 | S Africa, Channel Africa | 6035af | | | | | | | 15345as | | | |
| 0300 | 0330 | Thailand, Radio | 9655am | 11905am | 15395na | 0300 | 0400 | | Turkey, Voice of | 6155va | 11655as | 21715as | |
| 0300 | 0330 | USA, Voice of America | 4960af | | | 0300 | 0400 | | Uganda, Radio | 4976do | 5026do | | |
| 0300 | 0345 | Germany, Deutsche Welle | 9535na | 9640na | 11810na | 0300 | 0400 | | UK, BBC World Service | 5975na | 6005af | 6135am | |
| | | | 13780am | 15105na | | | | | | 6175na | 6190af | 6195eu | 7120af |
| 0300 | 0356 | China China Radio International | 9690na | | | | | | | 7160af | 9410eu | 11730af | 11760me |
| 0300 | 0400 | Anguilla, Caribbean Beacon | 6090am | | | | | | | 11955as | 12095af | 15280as | 15310as |
| 0300 | 0400 | Australia, ABC/Alice Springs | 4835do | | | 0300 | 0400 | | Ukraine, R Ukraine International | 15360as | 17760as | 21660as | |
| 0300 | 0400 | Australia, ABC/Katherine | 5025do | | | 0300 | 0400 | | USA, Armed Forces Network | 6020eu | 9640eu | 12045eu | 13590eu |
| 0300 | 0400 | Australia, ABC/Tennant Creek | 4910do | | | 0300 | 0400 | | USA, KAJI Dallas TX | 4278am | 6458am | 12689am | |
| 0300 | 0400 | Australia, Radio | 9660pa | 12080va | 15240pa | 0300 | 0400 | | USA, KLTN Salt Lake City UT | 5755va | 7510na | | |
| | | | 15415as | 15515va | 17580pa | 0300 | 0400 | | USA, KVOH Los Angeles CA | 7510na | | | |
| | | | 17750as | 21725pa | | 0300 | 0400 | vl | USA, KWHR Naalehu HI | 9975am | | | |
| 0300 | 0400 | Botswana, Radio | 3356do | 4820do | 7255do | 0300 | 0400 | | USA, Voice of America | 17510as | | | |
| 0300 | 0400 | Canada, CBC Northern Service | 9625do | | | 0300 | 0400 | | | 6080af | 6115af | 7105af | 7275af |
| 0300 | 0400 | Canada, CFRX Toronto ON | 6070do | | | | | | | 7290af | 7340af | 9575af | 9885af |
| 0300 | 0400 | Canada, CFVP Calgary AB | 6030do | | | | | | | 17725af | | | |
| 0300 | 0400 | Canada, CKZN St John's NF | 6160do | | | 0300 | 0400 | | USA, WBCQ Monticello ME | 7415na | 9330na | | |
| 0300 | 0400 | Canada, CKZU Vancouver BC | 6160do | | | 0300 | 0400 | | USA, WEWN Birmingham AL | 5825va | | | |
| 0300 | 0400 | Costa Rica, Faro del Caribe | 5054ca | 6175ca | 9644ca | 0300 | 0400 | | USA, WGTG McCaysville GA | 5085va | 6890am | | |
| 0300 | 0400 | Costa Rica, R for Peace Intl | 6970va | 15049va | | 0300 | 0400 | | USA, WHRA Greenbush ME | 7580na | | | |
| 0300 | 0400 | Costa Rica, University Network | 5030am | 6150va | 7375na | 0300 | 0400 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | |
| | | | 11870va | 13749af | | 0300 | 0400 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 0300 | 0400 | Cuba, Radio Havana | 6000na | 9820na | 11705na | 0300 | 0400 | | USA, WRMI Miami FL | 7385na | | | |
| 0300 | 0400 | Ecuador, HCBJ | 9745na | 15115na | 21455usb | 0300 | 0400 | | USA, WRNO New Orleans LA | 7395na | | | |
| 0300 | 0400 | Guatemala, Radio Cultural | 3300do | 5955do | | 0300 | 0400 | | USA, WSHB Cypress Crk SC | 11930eu | | | |
| 0300 | 0400 | Guyana, Voice of | 3289do | 5949do | | 0300 | 0400 | | USA, WTJC Newport NC | 9370na | | | |
| 0300 | 0400 | Honduras, Radio Luz y Vida | 3250ca | | | 0300 | 0400 | | USA, WWCN Nashville TN | 3215na | 5070na | 5935na | 7435na |
| 0300 | 0400 | Iraq, Radio Iraq International | 9684va | 11787va | | 0300 | 0400 | | USA, WYFR Okeechobee FL | 6065na | 9505na | | |
| 0300 | 0400 | Japan, Radio | 17825ca | 21610pa | | 0300 | 0400 | vl | Vanuatu, Radio | 3945do | | 7260do | |
| 0300 | 0400 | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | 0300 | 0400 | | Zambia, Christian Voice | 6065do | | | |
| 0300 | 0400 | Lesotho, Radio | 4800do | | | 0300 | 0400 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 0300 | 0400 | Malaysia, Radio | 7295do | | | 0300 | 0400 | vl | Zimbabwe, Zimbabwe BC Corp | 4828do | 6045do | | |
| 0300 | 0400 | Malaysia, Voice of Islam | 6175as | 9750as | 15295as | 0310 | 0340 | | Vatican City, Vatican Radio | 9660af | | | |
| 0300 | 0400 | Mexico, R Mexico International | 9705am | | | 0330 | 0345 | vl | Libya, Voice of Africa | 11815af | 15415af | 17725va | |
| 0300 | 0400 | Namibia, Namibian BC Corp | 3270af | 3289af | | 0330 | 0357 | | Czech Rep, Radio Prague Intl | 11600as | 15470as | | |
| 0300 | 0400 | New Zealand, R New Zealand Int | 17675va | | | 0330 | 0357 | | Vietnam, Voice of | 9795na | 9830na | | |
| 0300 | 0400 | Oman, Radio Sultanate of | 15355va | | | 0330 | 0400 | | Myanmar, Radio | 9730do | | | |
| 0300 | 0400 | Papua New Guinea, NBC | 9675do | 11880do | | 0330 | 0400 | | Sweden, Radio | 15245na | 15245 | | |
| 0300 | 0400 | Russia, Voice of Russia WS | 7125na | 9665na | 11990na | 0330 | 0400 | | UAE, Radio Dubai | 12005af | 13675na | 15395na | 15400na |
| | | | 15595na | 17595na | 17650na | 0345 | 0400 | f | Seychelles, FEBA Radio | 11885af | | | |
| | | | 17660na | 17690na | | 0357 | 0400 | vl | Malawi, Malawi BC Corp | 5995do | | | |
| | | | 6150do | | | | | | | | | | |
| 0300 | 0400 | Singapore R Corp of Singapore | 6150do | | | | | | | | | | |

SELECTED PROGRAMS

Daily

0300 China R. Int: News
0300 R. Australia: News
0320 UK, BBCWS Mideast/CIS stream: Sports Roundup (British/world reports/scores)
0320 UK, BBCWS E./S.Africa stream: Sports Roundup (British/world reports/scores)
0320 UK, BBCWS W/Cntrl Africa stream: Sports Roundup (British/world reports/scores)
0330 USA, VOA News Now: World News

Sunday

0300 R. Australia: Grandstand (live sports action)[to 0800]
0300 USA, VOA News Now: World News
0300 R. Australia: Grandstand (live sports action)[to 0800]
0300 USA, WBQC: Le Bon Bon Club
0305 R. Australia: Correspondents' Report (round-up of global stories)
0310 China R. Int: Report on Developing Countries (news/reports from)
0310 USA, VOA News Now: Regional News (news from the regions to
which VOA is broadcasting)
0314 USA, VOA News Now: US News
0318 USA, VOA News Now: Sports (reports/scores)
0320 China R. Int: In the Spotlight (cultural magazine)
0320 UK, BBCWS E.As/Aus/Pac stream: Sports Roundup (British/world
reports/scores)
0320 UK, BBCWS S. Asia stream: Sports Roundup (British/world re-
ports/scores)
0320 UK, BBCWS Americas stream: Sports Roundup (British/world re-
ports/scores)
0322 USA, VOA News Now: US feature (a report about the US)
0330 R. Australia: Feedback (listener letters/station news)
0333 USA, VOA News Now: Kaleidoscope (aspects of American culture
w/Susan Logue)[exc. 2nd Sun.]
0333 USA, VOA News Now: Women in Business [2nd Sun. only]

Monday

| | |
|------|---|
| 0300 | USA, WBCQ: Radio New York International (musical variety)[conf'd from 0000] |
| 0320 | UK, BBCWS Americas stream: Sports Roundup (British/world reports/scores) |
| 0330 | China R. Int: People in the Know (magazine on people modernizing China) |

Monday-Friday

0310 China R. Int: Current Affairs (world/domestic correspondents' reports)
0310 R. Australia: Margaret Throsby Interview (guest brings music and is interviewed)
0336 USA, VOA News Now: Dateline (news background/analysis)
0345 USA, VOA News Now: Science, Medicine and the Environment
0349 USA, VOA News Now: Business and Economic News
0354 USA, VOA News Now: General feature report (a topical report)

Tuesday

0300 USA, WBCQ: Barking Dogs and Running Water
0330 China R. Int: Sports World (magazine of sports and China)
0330 China R. Int: Sports World (magazine of sports and China)
0345 R. Sweden: Sportscan (reports/scores of events in Scandinavia)
0335 R. Habana Cuba: Time Out (Cuban sports)

Wednesday

0300 USA, WBCQ: Silk Purse
0330 China R. Int: China Horizons (business/economic development)
0335 R. Habana Cuba: Time Out (Cuban sports)

Thursday

0300 USA, WBCQ: Magic Radio
0330 China R. Int: Voices from Other Lands

0330 R. New Zealand Int: The World in Sport
0335 R. Habana Cuba: Time Out (Cuban sports)

Friday

0300 USA, WBCQ: Tasha Takes Control
0305 UK, BBCWS E.As/Aus/Pac stream: Focus on Football (how soccer is
developing globally)[Sust wk.]
0305 UK, BBCWS E.As/Aus/Pac stream: Sports International (issues/people
behind headlines)[exc. Sust wk.]
0330 China R. Int: Life in China (magazine of everyday life)
0330 Germany, Deutsche Welle: Spotlight on Sport (sports report)
0335 R. Habana Cuba: Time Out (Cuban sports)

Saturday

0300 R. Australia: Grandstand (live sports action)[cont'd from 0200]
0300 R. Australia: Grandstand (live sports action)[cont'd from 0200]
0300 USA, VOA News Now: World News
0300 USA, WBQC: The Right Perspective (conservative political comment/
phone-in)[live cont'd from 0200]
0305 R. Australia: Rural Reporter (people/life in Australia's regions)
0310 China R. Int: Global Review (weekly comment/analyses)
0310 USA, VOA News Now: Regional News (news from the regions to which
VOA is broadcasting)
0314 USA, VOA News Now: US News
0318 USA, VOA News Now: Sports (reports/scores)
0320 China R. Int: Listeners' Garden (letters/interactive features)
0322 USA, VOA News Now: US feature (a report about the US)
0330 R. Australia: Book Reading (from Australian literature)
0333 USA, VOA News Now: Our World (science/technology/agriculture w/
Rob Sivak)
0335 R. Habana Cuba: Time Out (Cuban sports)
0340 R. Australia: Lingua Franca (discussions about language)



FREQUENCIES

| | | | | | | | | | | | | | | |
|------|------|-------|------------------------------------|---------|---------|----------|---------|------|-------|-------------------------------|------------------------------------|---------|---------|---------|
| 0400 | 0405 | | USA, WWCR Nashville TN | 5070na | 5935na | 7435na | 0400 | 0500 | | Russia, Voice of Russia WS | 7125na | 9665na | 11990na | 15595na |
| 0400 | 0405 | sm | USA, WWCR Nashville TN | 3210na | | | | | | | 17565na | 17650na | 17660na | 17690na |
| 0400 | 0405 | twfha | USA, WWCR Nashville TN | 3215na | | | 0400 | 0500 | | Singapore R Corp of Singapore | 6150do | | | |
| 0400 | 0426 | | Belgium, Radio Vlaanderen Intl | 15565am | | | 0400 | 0500 | vi/as | Solomon Islands, SIBC | 5020do | | | |
| 0400 | 0429 | as | Canada, R Canada International | 11835me | 11975me | 15215me | 0400 | 0500 | vi/a | Solomon Islands, SIBC | 9545do | | | |
| 0400 | 0430 | | Israel, Kol Israel | 9435va | 15640va | 17535va | 0400 | 0500 | | Uganda, Radio | 4976do | 5026do | | |
| 0400 | 0430 | twfha | Mexico, R Mexico International | 9705am | | | 0400 | 0500 | | UK, BBC World Service | 3255af | 5975na | 6005af | 6005af |
| 0400 | 0430 | vi | Nigeria, Radio/Kaduna | 6090do | 7275do | | | | | 6135am | 6175na | 6190af | 6195eu | |
| 0400 | 0430 | | S Africa, Channel Africa | 5955af | | | | | | 7120af | 7160af | 9410eu | 11760me | |
| 0400 | 0430 | | Sri Lanka, Sri Lanka BC Corp | 6005as | 6075as | 6130do | 9770as | | | 12095eu | 15280as | 15310eu | 15420af | |
| | | | | 15425as | | | | | | 15575me | 17640af | 17760as | 17790as | |
| 0400 | 0430 | | Switzerland, Swiss R International | 9610eu | 9885am | 9905am | | 0400 | 0500 | | 21660as | 21830as | | |
| 0400 | 0445 | | Germany, Deutsche Welle | 7225af | 9565af | 9765af | 13690af | 0400 | 0500 | | 4278am | 6458am | 12689am | |
| 0400 | 0455 | | USA, WYFR Okeechobee FL | 6065na | 9505na | 9985eu | | 0400 | 0500 | | 5755va | | | |
| 0400 | 0456 | | China China Radio International | 9730na | | | | 0400 | 0500 | | 7510na | | | |
| 0400 | 0456 | | Romania, R Romania International | 9510na | 11885na | 11940na | 15105na | 0400 | 0500 | vi | USA, KVOH Los Angeles CA | 9975am | | |
| | | | | 15335as | 17745as | | | 0400 | 0500 | | USA, KWHR Naalehu HI | 17780as | | |
| 0400 | 0500 | | Anguilla, Caribbean Beacon | 6090am | | | | 0400 | 0500 | | 6080af | 7170va | 7265af | 7275af |
| 0400 | 0500 | vi | Australia, ABC/Alice Springs | 4835do | | | | | | | 7290af | 9575af | 9885af | 11965me |
| 0400 | 0500 | vi | Australia, ABC/Katherine | 5025do | | | | | | | 15205va | 17725af | | |
| 0400 | 0500 | vi | Australia, ABC/Tennant Creek | 4910do | | | | 0400 | 0500 | | 7415na | 9330na | | |
| 0400 | 0500 | | Australia, Radio | 9660pa | 12080va | 15240pa | 15415as | 0400 | 0500 | | 5825va | | | |
| | | | | 15515va | 17580pa | 17750as | 21725pa | 0400 | 0500 | | 5085va | 6890am | | |
| 0400 | 0500 | vi | Botswana, Radio | 3356do | 4820do | 7255do | | 0400 | 0500 | | 7580na | | | |
| 0400 | 0500 | vi | Cameroon, RTV/Yaounde | 4850do | | | | 0400 | 0500 | | 5745na | 7315sa | | |
| 0400 | 0500 | | Canada, CBC Northern Service | 9625do | | | | 0400 | 0500 | | 7490va | 13595as | | |
| 0400 | 0500 | | Canada, CFRX Toronto ON | 6070do | | | | 0400 | 0500 | stwhfa | 7385na | | | |
| 0400 | 0500 | | Canada, CFVP Calgary AB | 6030do | | | | 0400 | 0500 | m | 9955am | | | |
| 0400 | 0500 | | Canada, CKZN St John's NF | 6160do | | | | 0400 | 0500 | | 7395na | | | |
| 0400 | 0500 | | Canada, CKZU Vancouver BC | 6160do | | | | 0400 | 0500 | | 11930eu | 15195af | | |
| 0400 | 0500 | | Costa Rica, R for Peace Intl | 6970va | 15049va | | | 0400 | 0500 | | 9370na | | | |
| 0400 | 0500 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 0400 | 0500 | | 6065do | | | |
| | | | | 11870va | 13749af | | | 0400 | 0500 | vi | Zambia, Christian Voice | 6165do | 6265do | |
| 0400 | 0500 | | Cuba, Radio Havana | 6000na | 9820na | 11705na | | 0400 | 0500 | vi | Zambia, National BC Corp | 6165do | 6045do | |
| 0400 | 0500 | | Ecuador, HCJB | 9745na | 15115na | 21455usb | | 0405 | 05000 | | 3210na | 5070na | 5935na | 7435na |
| 0400 | 0500 | vi | Guatemala, Radio Cultural | 3300do | 5955do | | | 0425 | 0440 | | 5975af | 7150af | | |
| 0400 | 0500 | | Guyana, Voice of | 3289do | 5949do | | | 0430 | 0500 | | 6015na | 6155eu | 13730eu | |
| 0400 | 0500 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | 0430 | 0500 | | 3985va | | | |
| 0400 | 0500 | vi | Lesotho, Radio | 4800do | | | | 0430 | 0500 | | 6165na | 9590na | | |
| 0400 | 0500 | vi | Malawi, Malawi BC Corp | 3380do | 5995do | | | 0430 | 0500 | vi | Nigeria, Radio/Ibadan | 6050do | | |
| 0400 | 0500 | | Malaysia, Radio | 7295do | | | | 0430 | 0500 | vi | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do |
| 0400 | 0500 | | Malaysia, Voice of Islam | 6175as | 9750as | 15295as | | 0430 | 0500 | vi | Nigeria, Radio/Lagos | 3326do | 4990do | 9570do |
| 0400 | 0500 | | Myanmar, Radio | 9730do | | | | 0430 | 0500 | | S Africa, World Beacon | 6115af | | |
| 0400 | 0500 | | Namibia, Namibian BC Corp | 3270af | 3289af | | | 0430 | 0500 | | Serbia, Radio Yugoslavia | 11870na | | |
| 0400 | 0500 | | New Zealand, R New Zealand Int | 17675va | 7290do | | | 0430 | 0500 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | |
| 0400 | 0500 | | New Zealand, ZLXA | 3935do | | | | 0430 | 0500 | | Swaziland, Trans World Radio | 3200af | 4775af | |
| 0400 | 0500 | vi | Nigeria, Radio/Enugu | 6025do | | | | 0430 | 0500 | | Switzerland, Swiss R International | 9885am | 9905am | |
| 0400 | 0500 | vi | Papua New Guinea, NBC | 9675do | 11880do | | | 0445 | 0500 | | USA, WYFR Okeechobee FL | 9985eu | | |

SELECTED PROGRAMS

Daily

- 0400 China R. Int.: News
 0400 R. Australia: News
 0400 USA, VOA News Now: World News
 0410 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
 0414 USA, VOA News Now: US News
 0418 USA, VOA News Now: Sports (reports/scores)
 0418 USA, VOA News Now: Sports (reports/scores)
 0422 USA, VOA News Now: US feature (a report about the US)
 0430 USA, VOA News Now: World News

Sunday

- 0400 R. Australia: Grandstand (live sports action)[cont'd from 0300]
 0400 R. Australia: Grandstand (live sports action)[cont'd from 0300]
 0400 USA, WBCQ: Tom and Darryl (music/talk/skits/comedy)
 0405 R. Australia: Ockham's Razor (science issues)
 0410 China R. Int.: Report on Developing Countries (news/reports from)
 0420 China R. Int.: In the Spotlight (cultural magazine)
 0430 R. Australia: Oz Sounds (showcasing Australian music/performers)
 0430 USA, VOA News Now: World News
 0433 USA, VOA News Now: Encounter (two experts debate contrasting views)

Monday

- 0430 China R. Int.: People in the Know (magazine on people modernizing China)

Monday-Friday

- 0400 USA, WBCQ: Amos 'n Andy (classic radio comedy)
 0410 China R. Int.: Current Affairs (world/domestic correspondents' reports)
 0410 R. Australia: The World Today (relay of domestic current affairs program)
 0415 USA, WBCQ: Overcomer Ministry (Brother R.G. Stair preaches)[to 0615]
 0445 USA, VOA News Now: Science, Medicine and the Environment
 0449 USA, VOA News Now: Business and Economic News
 0450 UK, BBCWS E.As/Aus/Pac stream: Sports Roundup (British/world reports/scores)
 0450 UK, BBCWS Eu/N.Africa stream: Sports Roundup (British/world reports/scores)
 0450 UK, BBCWS Mideast/CIS stream: Sports Roundup (British/world reports/scores)
 0450 UK, BBCWS Americas stream: Sports Roundup (British/world reports/scores)
 0454 USA, VOA News Now: Music feature

Tuesday

- 0418 Belgium, R. Vlaanderen Int.: Sports (Belgian/European reports/scores from weekend)
 0430 China R. Int.: Sports World (magazine of sports and China)
 0430 China R. Int.: Sports World (magazine of sports and China)

Wednesday

- 0430 China R. Int.: China Horizons (business/economic development magazine)

Thursday

- 0430 China R. Int.: Voices from Other Lands (China thru eyes of visitors)

Friday

- 0430 China R. Int.: Life in China (magazine of everyday life)

Saturday

- 0400 R. Australia: Grandstand (live sports action)[cont'd from 0200]
 0400 R. Australia: Grandstand (live sports action)[cont'd from 0200]
 0400 USA, WBCQ: Amos 'n Andy (classic radio comedy)
 0405 R. Australia: Pacific Focus-Environment (regional ecology)
 0405 R. New Zealand Int.: The World in Sport (interviews/the week's results)
 0410 China R. Int.: Global Review (weekly comment/analyses)
 0415 USA, WBCQ: Overcomer Ministry (Brother R.G. Stair preaches)[to 0615]
 0420 China R. Int.: Listeners' Garden (listener letters/interactive features)
 0430 R. Australia: Asia Pacific (regional current events analysis)
 0430 USA, VOA News Now: World News
 0433 USA, VOA News Now: Press Conference USA (w/American/foreign correspondents)



FREQUENCIES

| | | | | | | | | | | | | | | |
|------|------|-------------------------------------|---------|---------|----------|---------|------|------|--------|-------------------------------|---------|---------|---------|---------|
| 0500 | 0515 | Canada, CBC Northern Service | 9625do | | | | 0500 | 0600 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| 0500 | 0520 | Vatican City, Vatican Radio | 4005eu | 5880eu | 7250eu | 9660af | | | | | | | | |
| | | | 11625af | 15570af | | | 0500 | 0600 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | |
| 0500 | 0529 | Canada, R Canada International | 5995am | 6145va | 7290va | 9595va | 0500 | 0600 | vl | Nigeria, Voice of | 7265af | 15120af | | |
| | | | 9755am | 11710va | 11830am | 13755va | 0500 | 0600 | vl | Papua New Guinea, NBC | 9675do | 11880do | | |
| | | | 15330va | | | | 0500 | 0600 | | Russia, Voice of Russia WS | 17625au | | 21790au | |
| 0500 | 0530 | Netherlands, Radio | 6165na | 9590na | | | 0500 | 0600 | | S Africa, World Beacon | 6115af | | | |
| 0500 | 0530 | S Africa, Adventist World Radio | 5960af | 6015af | | | 0500 | 0600 | | Singapore R Corp of Singapore | 6150do | | | |
| 0500 | 0530 | S Africa, Channel Africa | 11720af | | | | 0500 | 0600 | vl | Solomon Islands, SIBC | 5020do | 9545do | | |
| 0500 | 0530 | Switzerland, Swiss R International | 9610eu | | | | 0500 | 0600 | | Spain, R Exterior Espana | 6055na | | | |
| 0500 | 0530 | Uganda, Radio | 4976do | 5026do | | | 0500 | 0600 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | | |
| 0500 | 0530 | USA, WRMI Miami FL | 7385na | | | | 0500 | 0600 | | Swaziland, Trans World Radio | 4775af | 6100af | 9500af | |
| 0500 | 0530 | vi Zimbabwe, Zimbabwe BC Corp | 4828do | 6045do | | | 0500 | 0600 | | UK, BBC World Service | 3255af | 5975na | 6005af | 6175am |
| 0500 | 0545 | Germany, Deutsche Welle | 9670na | 9785na | 11810na | 11985na | | | | | 6190af | 6195eu | 7160af | 9410eu |
| 0500 | 0556 | China China Radio International | 9560na | | | | | | | | 9740as | 11760me | 11765af | 11955pa |
| 0500 | 0600 | Anguilla, Caribbean Beacon | 6090am | | | | | | | | 12095eu | 15280as | 13310as | 15360as |
| 0500 | 0600 | vi Australia, ABC/Alice Springs | 4835do | | | | | | | | 15420af | 15575me | 17640am | 17760as |
| 0500 | 0600 | vi Australia, ABC/Katherine | 5025do | | | | | | | | 17790as | 17885af | 21660as | |
| 0500 | 0600 | vi Australia, ABC/Tennant Creek | 4910do | | | | 0500 | 0600 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 0500 | 0600 | Australia, Radio | 9660pa | 12080va | 15240pa | 15515va | 0500 | 0600 | | USA, KAIJ Dallas TX | 5755va | | | |
| | | | 17580pa | 21725pa | | | 0500 | 0600 | | USA, KTNB Salt Lake City UT | 7510na | | | |
| 0500 | 0600 | as Australia, Radio | 17750as | | | | 0500 | 0600 | vl | USA, KVOH Los Angeles CA | 9975am | | | |
| 0500 | 0600 | vi Botswana, Radio | 3356do | 4820do | 7255do | | 0500 | 0600 | | USA, KWHR Naalehu HI | 11565pa | 17780as | | |
| 0500 | 0600 | Cameroon, RTV/Yaounde | 4850do | | | | 0500 | 0600 | | USA, Voice of America | 5970af | 6035af | 6080af | 7170va |
| 0500 | 0600 | Canada, CFRX Toronto ON | 6070do | | | | | | | | 7195af | 11965me | 12080af | 13670af |
| 0500 | 0600 | Canada, CFVP Calgary AB | 6030do | | | | | | | | 15205va | | | |
| 0500 | 0600 | Canada, CKZN St John's NF | 6160do | | | | 0500 | 0600 | | USA, WBCQ Monticello ME | 7415na | 9330na | | |
| 0500 | 0600 | Canada, CKZU Vancouver BC | 6160do | | | | 0500 | 0600 | | USA, WEWN Birmingham AL | 5825va | | | |
| 0500 | 0600 | Costa Rica, R for Peace Intl | 6970va | 15049va | | | 0500 | 0600 | | USA, WGTG McCaysville GA | 5085va | 6890am | | |
| 0500 | 0600 | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 0500 | 0600 | | USA, WHRA Greenbush ME | 11565af | | | |
| | | | 11870va | 13749af | | | 0500 | 0600 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | |
| 0500 | 0600 | Cuba, Radio Havana | 9550na | 9820na | 9830na | | 0500 | 0600 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 0500 | 0600 | Ecuador, HCJB | 9745na | 15115na | 21455usb | | 0500 | 0600 | | USA, WRNO New Orleans LA | 7395na | | | |
| 0500 | 0600 | Guyana, Voice of | 3289do | 5949do | | | 0500 | 0600 | | USA, WSHB Cypress Crk SC | 11930eu | 9840af | | |
| 0500 | 0600 | Italy, IRRS | 3985va | | | | 0500 | 0600 | | USA, WTJC Newport NC | 9370na | | | |
| 0500 | 0600 | Japan, Radio | 5975eu | 6110na | 7230eu | 11715as | 0500 | 0600 | | USA, WWCR Nashville TN | 2390na | 3210na | 5070na | 5935na |
| | | | 11760as | 11840as | 13630na | 15590pa | 0500 | 0600 | | USA, WYFR Okeechobee FL | 5985na | 9985eu | 11580eu | |
| 0500 | 0600 | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | 0500 | 0600 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 0500 | 0600 | vi Lesotho, Radio | 4800do | | | | 0500 | 0600 | | Zambia, Christian Voice | 6065do | | | |
| 0500 | 0600 | vi Liberia, R Liberia International | 5100do | | | | 0500 | 0600 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 0500 | 0600 | vi Malawi, Malawi BC Corp | 3380do | 5995do | | | 0505 | 0510 | | Croatia, Croatian Radio | 9470au | 11970al | | |
| 0500 | 0600 | Malaysia, Radio | 7295do | | | | 0515 | 0525 | | Rwanda, Radio | 6055do | | | |
| 0500 | 0600 | Malaysia, RTM Sarawak | 7160do | | | | 0520 | 0530 | | Vatican City, Vatican Radio | 9660af | 11625af | 15570af | |
| 0500 | 0600 | Malaysia, Voice of Islam | 6175as | 9750as | 15295as | | 0525 | 0600 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | |
| 0500 | 0600 | Myanmar, Radio | 9730do | | | | 0530 | 0600 | | Georgia, Georgian Radio | 11805eu | | | |
| 0500 | 0600 | Namibia, Namibian BC Corp | 3270af | 3289af | | | 0530 | 0600 | | Thailand, Radio | 9655eu | 11905eu | 21795eu | |
| 0500 | 0600 | New Zealand, R New Zealand Int | 17675va | | | | 0530 | 0600 | | UAE, Radio Dubai | 13675au | 15435au | 21700au | |
| 0500 | 0600 | New Zealand, ZLXA | 3935do | 7290do | | | 0530 | 0600 | mtwhfa | USA, WRMI Miami FL | 7385na | | | |
| 0500 | 0600 | Nigeria, Radio/Enugu | 6025do | | | | 0530 | 0600 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 0500 | 0600 | vi Nigeria, Radio/Ibadan | 6050do | | | | | | | | | | | |

SELECTED PROGRAMS

Daily

0500 R. Australia: News
0500 USA, VOA News Now: World News
0510 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
0514 USA, VOA News Now: US News
0518 USA, VOA News Now: Sports (reports/scores)
0518 USA, VOA News Now: Sports (reports/scores)
0522 USA, VOA News Now: US feature (a report about the US)
0530 USA, VOA News Now: World News

Sunday

0500 R. Australia: Grandstand (live sports action)[conf'd from 0300]
0500 R. Australia: Grandstand (live sports action)[conf'd from 0300]
0500 USA, WBCQ: Radio Timtron Worldwide
0505 R. Australia: Pacific Review (best of 'Pacific Beat')
0530 R. Australia: In Conversation (interviews on rural matters w/Zoe Daniel)
0533 USA, VOA News Now: Issues in the News (discussions w/Washington press)

Monday-Friday

0510 R. Australia: Pacific Beat (magazine of Pacific people/issues)
0530 R. Australia: Sport (reports/scores) ['Pacific Beat' continues af-
ter from 0510]
0530 R. Australia: Sport (reports/scores) ['Pacific Beat' continues af-
ter from 0510]

0536 USA, VOA News Now: Dateline (news background/analysis)
0545 USA, VOA News Now: Science, Medicine and the Environment
0549 USA, VOA News Now: Business and Economic News
0554 USA, VOA News Now: Music feature
0500 USA, WBCQ: Overcomer Ministry (Brother R.G. Stair preaches)[cont'd
from 0415

Tuesday-Saturday

0535 R. Habana Cuba: Time Out (Cuban sports)

Friday

0505 UK, BBCWS S. Asia stream: Sports International (issues/people behind headlines)[exc. Sust wk.]

0505 UK, BBCWS S. Asia stream: Focus on Football (how soccer is developing globally)[Sust wk.]

0530 Germanv. Deutsche Welle: Spotlight on Sport (weekly sports report)

Saturday

0500 R. Australia: Grandstand (live sports action)[cont'd from 0200]
0500 R. Australia: Grandstand (live sports action)[cont'd from 0200]
0500 USA, WBCQ: Overcomer Ministry (Brother R.G. Stair preaches)[cont'd
from 0415
0505 R. Australia: Pacific Focus-Sport (regional sports)
0505 R. Australia: Pacific Focus-Sport (regional sports)
0530 R. Australia: Carving Out (13-part series on Pacific development)
0533 USA, VOA News Now: Communications World (worldwide broadcast/
electronic media w/Kim Elliot)

Hauser's Highlights

PORTUGAL: RDP

From July 12 RDP Int'l canceled all broadcasts to East Timor in Portuguese:
1000-1100 and
2200-2300 on 11550 via Taiwan,
1400-1500 on 15345 via Lisbon
(*Observer*, Bulgaria)

RWANDA: Radio Rwanda

6055 from the DW relay near Kigali:

| | |
|-----------|--------|
| 0255-0600 | daily |
| 0600-0900 | Sunday |
| 0900-2100 | daily |

includes news in English

0515-0525
1915-1925

news in French

0445-0455

1800-1810

otherwise in Kinyarwanda and Swahili
(© BBC Monitoring)

FREQUENCIES

| | | | | | | | | | | | | | | | | |
|------|------|----------|----------------------------------|---------|---------|----------|---------|--|------|------|--------|----------------------------------|---------|---------|---------|---------|
| 0600 | 0605 | | New Zealand, R New Zealand int | 17675va | | | | | 0600 | 0700 | | Singapore R Corp of Singapore | 6150do | | | |
| 0600 | 0615 | | S Africa, Trans World Radio | 11640af | | | | | 0600 | 0700 | vl | Soloman Islands, SIBC | 5020do | 9545do | | |
| 0600 | 0615 | | USA, WBCQ Monticello ME | 7415na | | | | | 0600 | 0700 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | | |
| 0600 | 0615 | | USA, WBCQ Monticello ME | 7415na | | | | | 0600 | 0700 | | Swaziland, Trans World Radio | 4775af | 6100af | 9500af | |
| 0600 | 0630 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | 0600 | 0700 | | Uganda, Radio | 5026do | 7110do | 7196do | |
| 0600 | 0630 | mtwhfa | Malta, Voice of Mediterranean | 7150eu | | | | | 0600 | 0700 | | UK, BBC World Service | 6055af | 6175am | 6190af | 6195eu |
| 0600 | 0630 | | S Africa, Channell Africa | 15215af | | | | | | | | | 7160af | 9410eu | 9580va | 9740as |
| 0600 | 0630 | | S Africa, World Beacon | 6115af | | | | | | | | | 11760me | 11765af | 11940af | 11940af |
| 0600 | 0630 | | USA, Voice of America | 5970af | 6035af | 6080af | 7170va | | | | | | 11955pa | 12095eu | 15310as | 15360as |
| | | | | 7195af | 9680af | 11805af | 11965me | | | | | | 15420af | 15485eu | 15565as | 15575af |
| | | | | 11995af | 12080af | 13670af | 15205va | | | | | | 17640af | 17760as | 17790as | 17885af |
| | | | | 11940na | 15335na | | | | | | | | 21660as | | | |
| 0600 | 0641 | | Romania, R Romania International | 11940na | | | | | 0600 | 0700 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 0600 | 0645 | | Germany, Deutsche Welle | 6140eu | | | | | 0600 | 0700 | | USA, KALJ Dallas TX | 5755va | | | |
| 0600 | 0700 | | Anguilla, Caribbean Beacon | 6090am | | | | | 0600 | 0700 | | USA, KTVN Salt Lake City UT | 7510na | | | |
| 0600 | 0700 | vl | Australia, ABC/Alice Springs | 4835do | | | | | 0600 | 0700 | | USA, KWHR Naalehu HI | 11565pa | 17780os | | |
| 0600 | 0700 | vl | Australia, ABC/Katherine | 5025do | | | | | 0600 | 0700 | | USA, WEWN Birmingham AL | 5825va | | | |
| 0600 | 0700 | vl | Australia, ABC/Tennant Creek | 4910do | | | | | 0600 | 0700 | twhfa | USA, WGTG McCaysville GA | 5085va | 6890am | | |
| 0600 | 0700 | | Australia, Radio | 9660as | 12080va | 15240pa | 15415as | | 0600 | 0700 | | USA, WHRA Greenbush ME | 11565af | | | |
| | | | | 15515va | 17580pa | 17750as | 21725pa | | 0600 | 0700 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | |
| | | | | 9600do | 7255do | | | | 0600 | 0700 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 0600 | 0700 | vl | Botswana, Radio | 7225do | | | | | 0600 | 0700 | twhfa | USA, WRMI Miami FL | 7385na | | | |
| 0600 | 0700 | vl | Cameroon, RTV/Yaounde | 4850do | | | | | 0600 | 0700 | | USA, WRNO New Orleans LA | 7395na | | | |
| 0600 | 0700 | | Canada, CFRX Toronto ON | 6070do | | | | | 0600 | 0700 | | USA, WSHB Cypress Crk SC | 13650af | | | |
| 0600 | 0700 | | Canada, CFPX Calgary AB | 6030do | | | | | 0600 | 0700 | | USA, WTJC Newport NC | 9370na | | | |
| 0600 | 0700 | | Canada, CKZU Vancouver BC | 6160do | | | | | 0600 | 0700 | | USA, WWCN Nashville TN | 2390na | 3210na | 5070na | 5935na |
| 0600 | 0700 | | Costa Rica, R for Peace Intl | 6970va | | | | | 0600 | 0700 | | USA, WYFR Okeechobee FL | 5985na | 7355eu | | |
| 0600 | 0700 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | 0600 | 0700 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| | | | | 11870va | | | | | 0600 | 0700 | | Yemen, Rep of Yemen Radio | 9779me | | | |
| | | | | 13749af | | | | | 0600 | 0700 | | Zambia, Christian Voice | 9865do | | | |
| 0600 | 0700 | | Cuba, Radio Havana | 9550na | 9820na | 9830na | | | 0600 | 0700 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 0600 | 0700 | | Ecuador, HCJB | 9745na | 15115na | 15160usb | 21455va | | 0600 | 0700 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 0600 | 0700 | vl | Germany, Overcomer Ministries | 13810au | | | | | 0605 | 0610 | | Croatia, Croatian Radio | 9470au | 11970al | | |
| 0600 | 0700 | | Ghana, Ghana BC Corp | 3366do | 4915do | | | | 0605 | 0610 | mtwhfa | Greece, Voice of | 6165eu | 7365eu | 9830eu | |
| 0600 | 0700 | | Guyana, Voice of | 3289do | 5949do | | | | 0610 | 0620 | mtwhf | S. Africa, Trans World Radio | 7475va | 9375va | 9420va | 15630va |
| 0600 | 0700 | vl/mtwhf | Italy, IRRS | 7120pa | | | | | 0615 | 0630 | as | USA, WBCQ Monticello ME | 7415na | | | |
| 0600 | 0700 | | Japan, Radio | 5975eu | 7230eu | 11740as | 11840as | | 0630 | 0645 | | Finland, YLE/R Finland | 15250va | 21670va | | |
| | | | | 13630na | 15230pa | 21570pa | | | 0630 | 0645 | | Vatican City, Vatican Radio | 11625af | 13765af | 15570af | |
| | | | | 15110as | 15230as | | | | 0630 | 0645 | mtwhf | Vatican City, Vatican Radio | 4005eu | 5880eu | 7250eu | 9645eu |
| 0600 | 0700 | vl | Kuwait, Radio | 4800do | | | | | | | | | 11740eu | 15595eu | | |
| 0600 | 0700 | vl | Lesotho, Radio | 4760do | | | | | 0630 | 0700 | th | Georgia, Georgian Radio | 6080eu | | | |
| 0600 | 0700 | vl | Liberia, ELWA | 5100do | | | | | 0630 | 0700 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | |
| 0600 | 0700 | vl | Liberia, R Liberia International | 3380do | 5995do | | | | 0630 | 0700 | mtwhfa | UK, BBC World Service | 6175am | | | |
| 0600 | 0700 | vl | Malawi, Malawi BC Corp | 7295do | | | | | 0630 | 0700 | | USA, Voice of America | 7170va | 9680af | 11805af | 11965me |
| 0600 | 0700 | | Malaysia, Radio | 7160do | | | | | | | | | 15205va | | | |
| 0600 | 0700 | | Malaysia, RTM Sarawak | 6175as | 9750as | 15295as | | | 0630 | 0700 | as | USA, Voice of America | 5970af | 6035af | 6080af | 7195af |
| 0600 | 0700 | | Malaysia, Voice of | 9730do | | | | | | | | | 5970af | 12080af | 13670af | |
| 0600 | 0700 | | Myanmar, Radio | 3270af | 3289af | | | | 0641 | 0656 | | Romania, R Romania International | 9570eu | 9665eu | 11885na | 11940na |
| 0600 | 0700 | | Namibia, Namibian BC Corp | 3935do | 7290do | | | | | | | | 15250eu | 15335na | | |
| 0600 | 0700 | | New Zealand, ZLX | 6025do | | | | | | | | | 6045eu | | | |
| 0600 | 0700 | vl | Nigeria, Radio/Enugu | 6050do | | | | | | | | | 9870eu | | | |
| 0600 | 0700 | vl | Nigeria, Radio/Ibadan | 6075do | 6090do | 7275do | 9570do | | | | | | 6140eu | | | |
| 0600 | 0700 | vl | Nigeria, Radio/Kaduna | 4770do | 4990do | | | | | | | | 6045eu | | | |
| 0600 | 0700 | vl | Nigeria, Radio/Lagos | 3326do | 15120af | | | | | | | | 9870eu | | | |
| 0600 | 0700 | vl | Nigeria, Voice of | 7265af | 11880do | | | | | | | | | | | |
| 0600 | 0700 | vl | Papua New Guinea, NBC | 9675do | | | | | | | | | | | | |
| 0600 | 0700 | | Russia, Voice of Russia WS | 15490au | 17625ou | 17665au | 17665au | | | | | | | | | |
| | | | | 21790au | | | | | | | | | | | | |
| 0600 | 0700 | | Sierra Leone, Sierra Leone BS | 3316do | | | | | | | | | | | | |

SELECTED PROGRAMS

Daily

0600 R. Australia: News

Sunday

0600 R. Australia: Grandstand (live sports action)[con't'd from 0300]
0600 USA, WBCC: Tom and Darryl (music/talk/skits/comedy)[con't'd
from 0400]
0605 R. Australia: Pacific Focus-Arts (regional report on cultural mat-
ters)
0630 R. Australia: Correspondents' Report (round-up of global stories)
0633 USA, VOA News Now: Best of 'Talk to America' (highlights from
daily phone-in)

Monday

0610 R. Australia: Australian Music Show (contemporary music magazine)

0640 R. Australia: Music Deli (music from a variety of cultures)

Monday-Friday

0600 USA, VOA News Now: World News
0600 USA, WBQ: Overcomer Ministry (Brother R.G. Stain
preaches)[cont'd from 0415]
0610 USA, VOA News Now: Regional News (news from the regions to
which VOA is broadcasting)
0614 USA, VOA News Now: US News
0618 USA, VOA News Now: Sports (reports/scores)
0622 USA, VOA News Now: US feature (a report about the US)

0630 R. Australia: Sport (reports/scores)
0630 USA, VOA News Now: World News
0645 USA, VOA News Now: Science, Medicine and the Environment
0649 USA, VOA News Now: Business and Economic News
0654 USA, VOA News Now: Music feature

Tuesday

0610 R. Australia: Presenter's Pleasure (listener requests/staff choices)
0640 R. Australia: Australian Music Show (contemporary music magazine)
0615 USA, WBCQ: Financial Survival 2000 (financial advice for survivalists)

Wednesday

0610 R. Australia: Blacktracker (Aboriginal music/performance w/Mal Honess)
0615 USA, WBCQ: Financial Survival 2000 (financial advice for survivalists)
0640 R. Australia: Presenter's Pleasure (listener requests/staff choices)

Thursday

0610 R. Australia: Australian Country Style (Australian country music)
0615 USA, WBCQ: Financial Survival 2000 (financial advice for survivalists)
0640 R. Australia: Blacktracker (Aboriginal music/performance w/Mal Honess)

Friday

0610 R. Australia: Music Deli (music from a variety of cultures)
0640 R. Australia: Australian Country Style (Australian country music)

Saturday

0600 R. Australia: Grandstand (live sports action)[cont'd from 0200]
0600 USA, WBCQ: Overcomer Ministry (Brother R.G. Stair
preaches)[cont'd from 0415]
0605 R. Australia: Feedback (listener letters/station news)
0630 R. Australia: Arts Talk (cultural current events)
0633 USA, VOA News Now: On the Line (US foreign policy discussed)

Saturday-Sunday

0600 USA, VOA News Now: World News
0610 USA, VOA News Now: Regional News (news from the regions
to which VOA is broadcasting)
0614 USA, VOA News Now: US News
0618 USA, VOA News Now: Sports (reports/scores)
0622 USA, VOA News Now: US feature (a report about the US)
0630 USA, VOA News Now: World News

Hauser's Highlights

SEYCHELLES: FEBA

Until 29th Oct includes English:

| | | | |
|--------|-----------|----|-------|
| Daily | 1500-1600 | As | 11600 |
| Sun | 1630-1700 | | 11605 |
| Friday | 0345-0400 | Af | 11885 |
| | 0815-0900 | As | 15460 |
| | 1245-1300 | ME | 15535 |

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FREQUENCIES

| | | | | | | | | | | | | | | |
|------|------|--------|------------------------------------|---------|---------|----------|---------|------|------|-------|------------------------------------|---------|---------|----------|
| 0700 | 0720 | | Swaziland, Trans World Radio | 4775af | 6100af | 9500af | | 0800 | 0805 | | Pakistan, Radio | 17835eu | 21460eu | |
| 0700 | 0726 | | Belgium, Radio Vlaanderen Intl | 5985eu | 9865as | | | 0800 | 0810 | vl | Malawi, Malawi BC Corp | 3380do | 5995do | |
| 0700 | 0727 | | Czech Rep, Radio Prague Intl | 9880eu | 11600eu | | | 0800 | 0820 | | Germany, Trans World Radio | 6045eu | | |
| 0700 | 0730 | vl | Papua New Guinea, NBC | 9675do | 11880do | | | 0800 | 0820 | | Monaco, Trans World Radio | 9870eu | | |
| 0700 | 0730 | | Slovakia, R Slovakia International | 9440au | 15460au | 17550au | | 0800 | 0825 | | Malaysia, Voice of | 6275as | 9750as | 15295as |
| 0700 | 0730 | as | UK, BBC World Service | 17885af | | | | 0800 | 0830 | vl | Australia, ABC/Alice Springs | 4835do | | |
| 0700 | 0730 | mtwhfa | UK, BBC World Service | 6190af | | | | 0800 | 0830 | vl | Australia, ABC/Katherine | 5025do | | |
| 0700 | 0730 | a | USA, Voice of America | 6873va | | | | 0800 | 0830 | vl | Australia, ABC/Tennant Creek | 4910do | | |
| 0700 | 0745 | | USA, WYFR Okeechobee FL | 7355eu | 13695va | 15170eu | | 0800 | 0830 | | Myanmar, Radio | 9730do | | |
| 0700 | 0756 | | Romania, R Romania International | 15250af | 17735af | | | 0800 | 0900 | | Anguilla, Caribbean Beacon | 6090am | | |
| 0700 | 0800 | | Anguilla, Caribbean Beacon | 6090am | | | | 0800 | 0900 | | Australia, Radio | 5995pa | 9710pa | 12080va |
| 0700 | 0800 | vl | Australia, ABC/Alice Springs | 4835do | | | | | | | 15240va | 15415as | 17750as | 21725pa |
| 0700 | 0800 | vl | Australia, ABC/Katherine | 5025do | | | | 0800 | 0900 | vl | Botswana, Radio | 7255do | 9600do | 7255do |
| 0700 | 0800 | vl | Australia, ABC/Tennant Creek | 4910do | | | | 0800 | 0900 | vl | Cameroon, RTV/Yaounde | 4850do | | |
| 0700 | 0800 | | Australia, Radio | 9660pa | 12080va | 15240pa | 15415as | 0800 | 0900 | vl | Canada, CFRX Toronto ON | 6070do | | |
| | | | | 17580pa | 17750as | 21725pa | | 0800 | 0900 | | Canada, CFVP Calgary AB | 6030do | | |
| 0700 | 0800 | vl | Botswana, Radio | 7255do | 9600do | 7255do | | 0800 | 0900 | | Canada, CKZU Vancouver BC | 6160do | | |
| 0700 | 0800 | vl | Cameroon, RTV/Yaounde | 4850do | | | | 0800 | 0900 | | Costa Rica, R for Peace Intl | 6970va | | |
| 0700 | 0800 | | Canada, CFRX Toronto ON | 6070do | | | | 0800 | 0900 | | Costa Rica, University Network | 5030am | 6150va | 7375na |
| 0700 | 0800 | | Canada, CFVP Calgary AB | 6030do | | | | 0800 | 0900 | | | 11870va | 13749af | 9725na |
| 0700 | 0800 | | Canada, CKZU Vancouver BC | 6160do | | | | | | | | 11755pa | 15150eu | 21455usb |
| 0700 | 0800 | | Costa Rica, R for Peace Intl | 6970va | | | | 0800 | 0900 | mtwhf | Ecuador, HCJB | 15185af | | |
| 0700 | 0800 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 0800 | 0900 | as/vl | Eqt Guinea, Radio Africa | 15185af | | |
| | | | | 11870va | 13749af | | | 0800 | 0900 | a | Eqt. Guinea, Radio East Africa | 15185af | | |
| 0700 | 0800 | | Ecuador, HCJB | 11755pa | 15160eu | 21455usb | | 0800 | 0900 | | Finland, YLE/R Finland | 9560eu | | |
| 0700 | 0800 | mtwhf | Eqt Guinea, Radio Africa | 15185af | | | | 0800 | 0900 | | Germany, Deutsche Welle | 6140eu | | |
| 0700 | 0800 | as/vl | Eqt. Guinea, Radio East Africa | 15185af | | | | 0800 | 0900 | | Germany, Overcomer Ministries | 13810au | | |
| 0700 | 0800 | | Germany, Deutsche Welle | 6140eu | | | | 0800 | 0900 | | Germany, Voice of Hope | 5975eu | 21590me | |
| 0700 | 0800 | | Germany, Trans World Radio | 6045eu | | | | 0800 | 0900 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | |
| 0700 | 0800 | | Germany, Voice of Hope | 5975eu | | | | 0800 | 0900 | as | Guam, Trans World Radio | 15200as | 15330as | |
| 0700 | 0800 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | | 0800 | 0900 | | Guyana, Voice of | 3289do | 5949do | |
| 0700 | 0800 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | | 0800 | 0900 | | Indonesia, Voice of | 9525va | 11785va | 15149va |
| 0700 | 0800 | | Guyana, Voice of | 3289do | 5949do | | | 0800 | 0900 | vl/as | Italy, IRRS | 7120va | | |
| 0700 | 0800 | vl/as | Italy, IRRS | 7120va | | | | 0800 | 0900 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do |
| 0700 | 0800 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | | 0800 | 0900 | vl | Lesotho, Radio | 4800do | | |
| 0700 | 0800 | | Kuwait, Radio | 15110as | 15230as | | | 0800 | 0900 | vl | Liberia, ELWA | 4760do | | |
| 0700 | 0800 | vl | Lesotho, Radio | 4800do | | | | 0800 | 0900 | vl | Liberia, R Liberia International | 5100do | | |
| 0700 | 0800 | vl | Liberia, ELWA | 4760do | | | | 0800 | 0900 | | Malaysia, Radio | 7295do | | |
| 0700 | 0800 | vl | Liberia, R Liberia International | 5100do | | | | 0800 | 0900 | s | Malta, Voice of Mediterranean | 11770eu | | |
| 0700 | 0800 | vl | Malawi, Malawi BC Corp | 3380do | 5995do | | | 0800 | 0900 | | Namibia, Namibian BC Corp | 7165af | 7215af | |
| 0700 | 0800 | | Malaysia, Radio | 7295do | | | | 0800 | 0900 | | New Zealand, R New Zealand Int | 11720va | | |
| 0700 | 0800 | | Malaysia, RTM Sarawak | 7160do | | | | 0800 | 0900 | | New Zealand, ZLXA | 3935do | 7290do | |
| 0700 | 0800 | | Malaysia, Voice of | 6275as | 9750as | 15295as | | 0800 | 0900 | vl | Nigeria, Radio/Enugu | 6025do | | |
| 0700 | 0800 | | Monaco, Trans World Radio | 9870eu | | | | 0800 | 0900 | vl | Nigeria, Radio/Ibadan | 6050do | | |
| 0700 | 0800 | | Myanmar, Radio | 9730do | | | | 0800 | 0900 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do |
| 0700 | 0800 | | Namibia, Namibian BC Corp | 3270af | 3289af | | | 0800 | 0900 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | 9570do |
| 0700 | 0800 | | New Zealand, ZLXA | 3935do | 7290do | | | 0800 | 0900 | vl | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as |
| 0700 | 0800 | vl | Nigeria, Radio/Enugu | 6025do | | | | 0800 | 0900 | vl | Papua New Guinea, NBC | 4890do | 9675do | 15725as |
| 0700 | 0800 | vl | Nigeria, Radio/Ibadan | 6050do | | | | 0800 | 0900 | | Russia, Voice of Russia WS | 15490au | 17495au | 17665au |
| 0700 | 0800 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do | 0800 | 0900 | s | S Africa, Amateur Radio League | 9750af | 21560af | |
| 0700 | 0800 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | | 0800 | 0900 | | Sierra Leone, Sierra Leone BS | 3316do | | |
| 0700 | 0800 | | Palau, KHBN/Voice of Hope | 9965as | 9985as | 15725as | | 0800 | 0900 | vl | Singapore R Corp of Singapore | 6150do | | |
| 0700 | 0800 | | Russia, Voice of Russia WS | 15490au | 17495au | 17625au | 17665au | 0800 | 0900 | | Solomon Islands, SIBC | 5020do | | |
| | | | | 21790au | | | | 0800 | 0900 | | South Korea, R Korea Intl | 9570au | 13670eu | |
| 0700 | 0800 | | Sierra Leone, Sierra Leone BS | 3316do | | | | 0800 | 0900 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | |
| 0700 | 0800 | vl | Singapore R Corp of Singapore | 6150do | 9545do | | | 0800 | 0900 | | Uganda, Radio | 5026do | 7110do | 7196do |
| 0700 | 0800 | | Solomon Islands, SIBC | 5020do | | | | 0800 | 0900 | | UK, BBC World Service | 6190af | 9740as | 11940af |
| 0700 | 0800 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | | | | | | | 12095eu | 15360as | 11955pa |
| 0700 | 0800 | | Taiwan, R Taiwan International | 5950na | | | | 0800 | 0900 | as | USA, BBC World Service | 15565eu | 15640as | 15485eu |
| 0700 | 0800 | | Uganda, Radio | 5026do | 7110do | 7196do | | 0800 | 0900 | | USA, Armed Forces Network | 21660as | 17640eu | 17760as |
| 0700 | 0800 | | UK, BBC World Service | 6190af | 9580va | 9740as | 11760me | 0800 | 0900 | as | USA, KAIJ Dallas TX | 5755va | 17885af | 21830va |
| | | | | 11765af | 11940af | 11955pa | 12095eu | 0800 | 0900 | | USA, KAIJ Dallas TX | 5755va | 6458am | 12689am |
| | | | | 15310as | 15360as | 15400af | 15485eu | 0800 | 0900 | | USA, KNLS Anchor Point AK | 11765as | | |
| | | | | 15565eu | 17640eu | 17760as | 17790as | 0800 | 0900 | | USA, KTBN Salt Lake City UT | 7510na | | |
| | | | | 17830af | 21660as | 12689am | | 0800 | 0900 | | USA, KTBN Salt Lake City UT | 7510na | | |
| 0700 | 0800 | | USA, Armed Forces Network | 4278am | 6458am | | | 0800 | 0900 | | USA, KWHR Naalehu HI | 11565pa | 17780as | |
| 0700 | 0800 | | USA, KAIJ Dallas TX | 5755va | | | | 0800 | 0900 | | USA, KWHR Naalehu HI | 11565pa | 13610as | 15150as |
| 0700 | 0800 | | USA, KTBN Salt Lake City UT | 7510na | | | | 0800 | 0900 | | USA, Voice of America | 11775as | | |
| 0700 | 0800 | | USA, KWHR Naalehu HI | 11565pa | 17780as | | | 0800 | 0900 | | USA, WEWN Birmingham AL | 5825va | | |
| 0700 | 0800 | | USA, WBCQ Monticello ME | 7415na | | | | 0800 | 0900 | | USA, WHRA Greenbush ME | 5825va | | |
| 0700 | 0800 | | USA, WEWN Birmingham AL | 5825va | | | | 0800 | 0900 | | USA, WHRI Noblesville IN | 5745na | 7315sa | |
| 0700 | 0800 | | USA, WHRA Greenbush ME | 11565af | | | | 0800 | 0900 | | USA, WJCR Upton KY | 7490va | 13595as | |
| 0700 | 0800 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | | 0800 | 0900 | | USA, WRNO New Orleans LA | 7395na | | |
| 0700 | 0800 | | USA, WJCR Upton KY | 7490va | 13595as | | | 0800 | 0900 | | USA, WSHB Cypress Crk SC | 9845au | 9860eu | |
| 0700 | 0800 | | USA, WRNO New Orleans LA | 7395na | | | | 0800 | 0900 | | USA, WTJC Newport NC | 9370na | | |
| 0700 | 0800 | | USA, WSHB Cypress Crk SC | 13650af | | | | 0800 | 0900 | | USA, WWCR Nashville TN | 2390na | 3210na | 5070na |
| 0700 | 0800 | | USA, WTJC Newport NC | 9370na | 3210na | 5070na | 5935na | 0800 | 0900 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do |
| 0700 | 0800 | vl | USA, WWCR Nashville TN | 2390na | 3210na | 5070na | 5935na | 0800 | 0900 | vl | Zambia, Christian Voice | 9865do | | |
| 0700 | 0800 | | Vanuatu, Radio | 3945do | 4960do | 7260do | | 0800 | 0900 | vl | Zambia, National BC Corp | 6165do | 6265do | |
| 0700 | 0800 | vl | Zambia, Christian Voice | 9865do | | | | 0800 | 0900 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | |
| 0700 | 0800 | vl | Zambia, National BC Corp | 6165do | 6265do | | | 0800 | 0900 | f | Croatia, Croatian Radio | 13820au | | |
| 0700 | 0800 | | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | | 0800 | 0900 | s | Croatia, Croatian Radio | 6165eu | 7365eu | 9830eu |
| 0705 | 0710 | s | Croatia, Croatian Radio | 13820au | | | | 0815 | 0900 | | New Zealand, R New Zealand Int | 11720va | | |
| 0705 | 0710 | | Croatia, Croatian Radio | 6165eu | 7365eu | 9830eu | | 0820 | 0850 | s | New Zealand, R New Zealand Int | 11720va | | |
| 0705 | 0800 | as | New Zealand, R New Zealand Int | 11720va | | | | 0820 | 0850 | s | Guam, Trans World Radio | 15200as | | |
| 0706 | 0800 | | New Zealand, R New Zealand Int | 11720va | | | | 0830 | 0900 | vl | Austria, R Austria International | 15410me | 17870me | |
| 0730 | 0740 | as | Guam, Trans World Radio | 15200as | | | | 0830 | 0900 | vl | Georgia, Georgian Radio | 11910eu | | |
| 0730 | 0800 | | Austria, R Austria International | 15410me | 17870me | | | 0830 | 0900 | vl | Papua New Guinea, NBC | 4890do | 9675do | |
| 0730 | 0800 | vl | Georgia, Georgian Radio | 11910eu | | | | 0830 | 0900 | vl | Switzerland, Swiss R International | 15545af | 17685af | 21750af |
| 0730 | 0800 | | Papua New Guinea, NBC | 4890do | 9675do | | | 0830 | 0900 | a | UK, BBC World Service | 15575as | 17885af | |
| 0730 | 0800 | | Switzerland, Swiss R International | 15545af | 17685af | 21750af | | 0830 | 0900 | | Guam, Trans World Radio | 15200as | | |
| 0730 | 0800 | as | UK, BBC World Service | 15575as | 17885af | | | 0840 | 0900 | s | Greece, Voice of | 9775sa | | |
| 0740 | 0800 | | Guam, Trans World Radio | 15200as | | | | | | | | | | |
| 0750 | 0800 | as | Greece, Voice of | 9775sa | | | | | | | | | | |

FREQUENCIES

| | | | | | | | | | | | | | | | |
|------|------|--------|----------------------------------|---------|----------|---------|---------|------|------|------------------------------------|----------------------------------|---------|----------|---------|---------|
| 0900 | 0915 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | | 1000 | 1027 | Vietnam, Voice of | 9839as | 12019as | | | |
| 0900 | 0915 | | Guam, Trans World Radio | 15200as | 15330as | | | 1000 | 1030 | Netherlands, Radio | 9795as | 12065as | 13710as | | |
| 0900 | 0929 | | Czech Rep, Radio Prague Intl | 21745va | | | | 1000 | 1030 | Singapore, RTE Radio | 11740va | | | | |
| 0900 | 0930 | | UK, BBC World Service | 6190af | 6195va | 9605as | 9740as | 1000 | 1030 | Sri Lanka, Sri Lanka BC Corp | 4940do | | | | |
| | | | | 11760me | 11765as | 11940af | 11945af | 1000 | 1030 | Switzerland, Swiss R International | 15315eu | | | | |
| | | | | 11955pa | 12095eu | 15190sa | 15310as | 1000 | 1056 | China China Radio International | 11730pa | 15210pa | | | |
| | | | | 15360as | 15400af | 15485eu | 15565eu | 1000 | 1100 | Anguilla, Caribbean Beacon | 11775am | | | | |
| | | | | 15575as | 17640eu | 17760as | 17790as | 1000 | 1100 | vl | Australia, ABC/Alice Springs | 2310do | | | |
| | | | | 17830af | 17885af | 21470af | 21660as | 1000 | 1100 | vl | Australia, ABC/Katherine | 2485do | | | |
| 0900 | 0930 | mtwhfa | UK, BBC World Service | 11945as | | | | 1000 | 1100 | vl | Australia, ABC/Tennant Creek | 2325do | | | |
| 0900 | 0945 | | Germany, Deutsche Welle | 6140eu | 6160pa | 12035af | 15105as | 1000 | 1100 | as | Australia, Radio | 11880va | 13605pa | 17750as | 21820as |
| | | | | 15410af | 15470as | 17770as | 17800af | 1000 | 1100 | vl | Bhutan, Bhutan BC Service | 6035do | | | |
| | | | | 21560as | 21680as | 21790af | 21775af | 1000 | 1100 | vl | Botswana, Radio | 7255do | 9600do | 7255do | |
| | | | | 11730pa | 15210pa | | | 1000 | 1100 | | Cameroon, RTV/Yaounde | 4850do | | | |
| 0900 | 0956 | | China China Radio International | 6090am | | | | 1000 | 1100 | | Canada, CFRX Toronto ON | 6070do | | | |
| 0900 | 1000 | | Anguilla, Caribbean Beacon | 2310do | | | | 1000 | 1100 | | Canada, CFVP Calgary AB | 6030do | | | |
| 0900 | 1000 | vl | Australia, ABC/Alice Springs | 2485do | | | | 1000 | 1100 | | Canada, CKZN St John's NF | 6160do | | | |
| 0900 | 1000 | vl | Australia, ABC/Katherine | 2485do | | | | 1000 | 1100 | | Canada, CKZU Vancouver BC | 6160do | | | |
| 0900 | 1000 | vl | Australia, ABC/Tennant Creek | 2325do | | | | 1000 | 1100 | as | Costa Rica, R for Peace Intl | 6970va | | | |
| 0900 | 1000 | | Australia, Radio | 13605pa | 21820as | | | 1000 | 1100 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na |
| 0900 | 1000 | as | Australia, Radio | 11550va | 11880va | 17750va | | 1000 | 1100 | | | 11870va | 13749af | | |
| 0900 | 1000 | vl | Botswana, Radio | 7255do | 9600do | 7255do | | 1000 | 1100 | | Ecuador, HCJB | 11755pa | 21455usb | | |
| 0900 | 1000 | vl | Cameroon, RTV/Yaounde | 4850do | | | | 1000 | 1100 | mtwhf | Eqt Guinea, Radio Africa | 15185af | | | |
| 0900 | 1000 | | Canada, CFRX Toronto ON | 6070do | | | | 1000 | 1100 | as/vl | Eqt. Guinea, Radio East Africa | 15185af | | | |
| 0900 | 1000 | | Canada, CFVP Calgary AB | 6030do | | | | 1000 | 1100 | | Germany, Deutsche Welle | 6140eu | | | |
| 0900 | 1000 | | Canada, CKZU Vancouver BC | 6160do | | | | 1000 | 1100 | | Germany, Voice of Hope | 5975eu | 21590me | | |
| 0900 | 1000 | as | Costa Rica, R for Peace Intl | 6970va | | | | 1000 | 1100 | vl | Ghana, Ghana BC Corp | 6130do | 4915do | | |
| 0900 | 1000 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 1000 | 1100 | vl/as | Ghana, Ghana BC Corp | 4915do | 4915do | | |
| | | | | 11870va | 13749af | | | 1000 | 1100 | | Guam, Trans World Radio | 9865as | | | |
| | | | | 11775pa | 21455usb | | | 1000 | 1100 | | Guyana, Voice of | 5949do | | | |
| 0900 | 1000 | | Ecuador, HCJB | 15185af | | | | 1000 | 1100 | | India, All India Radio | 11585as | 13700au | 15020as | 17485au |
| 0900 | 1000 | mtwhf | Eqt Guinea, Radio Africa | 15185af | | | | 1000 | 1100 | vl/as | Italy, IRRS | 17840as | 17895au | | |
| 0900 | 1000 | as/vl | Eqt. Guinea, Radio East Africa | 15185af | | | | 1000 | 1100 | | Japan, Radio | 7120va | 15590as | 21570pa | |
| 0900 | 1000 | a | Germany, Good News World R | 5985eu | 5995eu | | | 1000 | 1100 | | Jordan, Radio | 17680eu | | | |
| 0900 | 1000 | | Germany, Voice of Hope | 5975eu | 21590me | | | 1000 | 1100 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | |
| 0900 | 1000 | | Guyana, Voice of | 3289do | 5949do | | | 1000 | 1100 | | Lesotho, Radio | 4800do | | | |
| 0900 | 1000 | vl/as | Italy, IRRS | 7120va | | | | 1000 | 1100 | vl | Liberia, ELWA | 4760do | | | |
| 0900 | 1000 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | | 1000 | 1100 | vl | Liberia, R Liberia International | 6100do | | | |
| 0900 | 1000 | vl | Lesotho, Radio | 4800do | | | | 1000 | 1100 | | Malaysia, Radio | 7295do | | | |
| 0900 | 1000 | vl | Liberia, ELWA | 4760do | | | | 1000 | 1100 | | N Marianas, KHBI Saipan | 11840as | | | |
| 0900 | 1000 | vl | Liberia, R Liberia International | 6100do | | | | 1000 | 1100 | | Namibia, Namibian BC Corp | 7165af | 7215af | | |
| 0900 | 1000 | | Malaysia, Radio | 7295do | | | | 1000 | 1100 | | New Zealand, R New Zealand Int | 11720va | | | |
| 0900 | 1000 | | Namibia, Namibian BC Corp | 7165af | 7215af | | | 1000 | 1100 | | New Zealand, ZLXA | 3935do | | | |
| 0900 | 1000 | | New Zealand, R New Zealand Int | 11720va | | | | 1000 | 1100 | vl | Nigeria, Radio/Enugu | 6025do | | | |
| 0900 | 1000 | | New Zealand, ZLXA | 3935do | 7290do | | | 1000 | 1100 | vl | Nigeria, Radio/Ibadan | 6050do | | | |
| 0900 | 1000 | vl | Nigeria, Radio/Enugu | 6025do | | | | 1000 | 1100 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| 0900 | 1000 | vl | Nigeria, Radio/Ibadan | 6050do | | | | 1000 | 1100 | vl | Nigeria, Radio/Lagos | 4990do | 7285do | | |
| 0900 | 1000 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do | 1000 | 1100 | vl | Nigeria, Voice of | 7265af | 15120af | | |
| 0900 | 1000 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | | 1000 | 1100 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 15725as |
| 0900 | 1000 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 15725as | 1000 | 1100 | vl | Papua New Guinea, NBC | 4890do | 9675do | | |
| 0900 | 1000 | vl | Papua New Guinea, NBC | 4890do | 9675do | | | 1000 | 1100 | | Seirra Leone, Sierra Leone BS | 5980do | | | |
| 0900 | 1000 | | Sierra Leone, Sierra Leone BS | 3316do | | | | 1000 | 1100 | | Singapore R Corp of Singapore | 6150do | | | |
| 0900 | 1000 | | Singapore R Corp of Singapore | 6150do | | | | 1000 | 1100 | vl | Solomon Islands, SIBC | 5020do | | | |
| 0900 | 1000 | vl | Solomon Islands, SIBC | 5020do | | | | 1000 | 1100 | | Uganda, Radio | 5026do | 7110do | 7196do | |
| 0900 | 1000 | | Sri Lanka, Sri Lanka BC Corp | 6130do | | | | 1000 | 1100 | | UK, BBC World Service | 5965na | 6190af | 6195va | 9740as |
| 0900 | 1000 | | Uganda, Radio | 5026do | 7110do | 7196do | | | | | | 11760me | 11940af | 11955pa | 12095eu |
| 0900 | 1000 | | UK, Merlin Network One | 6130eu | | | | | | | | 15310as | 15360as | 15485eu | 15565eu |
| 0900 | 1000 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | | | | | | 15575as | 17640eu | 17760as | 17790as |
| 0900 | 1000 | | USA, KAJI Dallas TX | 5755va | | | | 1000 | 1100 | as | UK, BBC World Service | 15190sa | 15400af | 17830af | |
| 0900 | 1000 | | USA, KTNB Salt Lake City UT | 7510na | | | | 1000 | 1100 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 0900 | 1000 | | USA, KWHR Naalehu HI | 11565pa | 17780as | | | 1000 | 1100 | | USA, KAJI Dallas TX | 5755va | | | |
| 0900 | 1000 | | USA, Voice of America | 11775as | 13610as | 15150as | | 1000 | 1100 | | USA, KTNB Salt Lake City UT | 7510na | | | |
| 0900 | 1000 | | USA, WEWN Birmingham AL | 5825va | | | | 1000 | 1100 | | USA, KWHR Naalehu HI | 9930as | 11565pa | | |
| 0900 | 1000 | | USA, WHRA Greenbush ME | 11565af | | | | 1000 | 1100 | | USA, Voice of America | 6160as | 9645as | 9760as | 9770pa |
| 0900 | 1000 | | USA, WHRI Noblesville IN | 5745na | 7315sa | | | 1000 | 1100 | | | 15160as | 15240as | 15425as | |
| 0900 | 1000 | | USA, WJCR Upton KY | 7490va | 13595as | | | 1000 | 1100 | | USA, WEWN Birmingham AL | 7425na | 15745eu | | |
| 0900 | 1000 | | USA, WRNO New Orleans LA | 7395na | | | | 1000 | 1100 | | USA, WHRI Noblesville IN | 6040na | 9495sa | | |
| 0900 | 1000 | | USA, WSHB Cypress Crk SC | 9455sa | 9860eu | | | 1000 | 1100 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 0900 | 1000 | | USA, WTJC Newport NC | 9370na | | | | 1000 | 1100 | mtwhfa | USA, WRMI Miami FL | 9955am | | | |
| 0900 | 1000 | | USA, WWCR Nashville TN | 2390na | 5070na | 5935na | 7435na | 1000 | 1100 | | USA, WRNO New Orleans LA | 7395na | | | |
| 0900 | 1000 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | | 1000 | 1100 | | USA, WSHB Cypress Crk SC | 6095na | 9455sa | | |
| 0900 | 1000 | | Zambia, Christian Voice | 9865do | | | | 1000 | 1100 | | USA, WTJC Newport NC | 9370na | | | |
| 0900 | 1000 | vl | Zambia, National BC Corp | 6165do | 6265do | | | 1000 | 1100 | | USA, WWCR Nashville TN | 2390na | 5070na | 5935na | 9475na |
| 0900 | 1000 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | | 1000 | 1100 | vl | USA, WYFR Keeshobee FL | 5950na | | | |
| 0915 | 0930 | | Guam, Trans World Radio | 15330as | | | | 1000 | 1100 | | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 0915 | 1000 | vl | Ghana, Ghana BC Corp | 6130do | 4915do | | | 1000 | 1100 | vl | Zambia, Christian Voice | 9865do | | | |
| 0915 | 1000 | vl/as | Ghana, Ghana BC Corp | 4915do | 4915do | | | 1000 | 1100 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 0915 | 1000 | mtwhf | USA, WRMI Miami FL | 9955am | | | | 1000 | 1100 | mtwhf | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 0930 | 1000 | | Guam, Trans World Radio | 9865as | | | | 1015 | 1030 | | Vatican City, Vatican Radio | 5880eu | 9645eu | 11740eu | 15595eu |
| 0930 | 1000 | | Lithuania, Radio Vilnius | 9710eu | | | | | | | | 21850eu | | | |
| 0930 | 1000 | | Netherlands, Radio | 9795as | 12065as | 13710as | | 1030 | 1045 | mtwhf | Ethiopia, Radio | 5990do | 7110do | 9705do | |
| 0930 | 1000 | | UK, BBC World Service | 6190af | 6195as | 9740as | 11760me | 1030 | 1057 | | Czech Rep, Radio Prague Intl | 9880eu | 11615eu | | |
| | | | | 11940af | 11945as | 11955pa | 12095eu | 1030 | 1100 | | Guam, Adventist World Radio | 11795as | | | |
| | | | | 15190sa | 15310as | 15400af | 15485eu | 1030 | 1100 | | Israel, Kol Israel | 15650va | 17535va | | |
| | | | | 15565eu | 15575as | 17640eu | 17760as | 1030 | 1100 | | Malaysia, RTM Sarawak | 7160do | | | |
| | | | | 17790as | 17830af | 17885af | 21470af | 1030 | 1100 | | Mongolia, Voice of | 12085eu | | | |
| | | | | 21660as | | | | | | | Netherlands, Radio | 6045eu | 9795as | 9860eu | 12065as |
| | | | | 6140eu | | | | 1030 | 1100 | | | 13710as | | | |
| 0945 | 1000 | | Germany, Deutsche Welle | 6140eu | | | | 1030 | 1100 | | South Korea, R Korea Intl | 11715na | | | |
| | | | | | | | | 1030 | 1100 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 11835as | 15120as | 17850as |
| | | | | | | | | 1030 | 1100 | | UAE, Radio Dubai | 13675eu | 15370eu | 15395eu | 21605as |



FREQUENCIES

| | | | | | | | | | |
|-----------|--------------------------------------|---------------------------------|-------------------------|-----------|-------|------------------------------------|---------|---------|----------------|
| 1100 1105 | Pakistan, Radio | 17835eu | 21460eu | 1100 1200 | vi | Liberia, ELWA | 4760do | | |
| 1100 1120 | fa Kazakhstan, Radio Almaty | 11840eu | | 1100 1200 | vi | Liberia, R Liberia International | 6100do | | |
| 1100 1127 | Vietnam, Voice of | 7285as | | 1100 1200 | | Malaysia, Radio | 7295do | | |
| 1100 1130 | Netherlands, Radio | 6045eu | 9795as 9860eu 12065as | 1100 1200 | | Malaysia, TRM Sarawak | 7160do | | |
| | | 13710as | | 1100 1200 | | N Marianas, KHBI Saipan | 11840as | | |
| 1100 1130 | Sri Lanka, Sri Lanka BC Corp | 4940do | 11835as 15210as 17850as | 1100 1200 | | Namibia, Namibian BC Corp | 7165af | 7215af | |
| 1100 1130 | mtwhf UK, BBC Caribbean Report | 6195 ca 15220 ca | | 1100 1200 | | New Zealand, R New Zealand Int | 11720va | | |
| 1100 1130 | as UK, BBC World Service | 5965na 6195as 9580as 9740as | | 1100 1200 | | New Zealand, ZLXA | 3935do | | |
| | | 11760me 11955as 12095eu 15280as | | 1100 1200 | vi | Nigeria, Radio/Enugu | 6025do | | |
| | | 15220am 15310as 15400af 15485eu | | 1100 1200 | vi | Nigeria, Radio/Ibadan | 6050do | | |
| | | 15565eu 15575as 17640as 17700as | | 1100 1200 | vi | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do 9570do |
| | | 17790sa 17830af 17885af 21470af | | 1100 1200 | vi | Nigeria, Radio/Lagos | 4990do | 7285do | |
| 1100 1130 | as UK, BBC World Service | 6195na 15190sa 15220am | | 1100 1200 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as 13840as |
| 1100 1130 | mtwhf USA, Voice of America | 13675af 15550af 17650af 17780af | | 1100 1200 | vi | Papua New Guinea, NBC | 4890do | 9675do | |
| | | 21600af | | 1100 1200 | | Sierra Leone, Sierra Leone BS | 5980do | | |
| 1100 1130 | mtwhf USA, Voice of America | 13675af 15550af 17650af 17780af | | 1100 1200 | | Singapore, R Singapore Intl | 6150as | 9590as | |
| | | 21600af | | 1100 1200 | | Switzerland, Swiss R International | 13735as | 21770as | |
| 1100 1130 | mtwhf USA, WRMI Miami FL | 9955am | | 1100 1200 | | Taiwan, Voice of Asia | 7445as | | |
| 1100 1145 | Germany, Deutsche Welle | 6140eu 17860af | 11785af 15410af 17680af | 1100 1200 | | Uganda, Radio | 5026do | 7110do | 7196do |
| | | 11775am | | 1100 1200 | mtwhf | UK, BBC World Service | 6190af | 11940af | |
| 1100 1200 | Anguilla, Caribbean Beacon | 2310do | | 1100 1200 | a | UK, Virgin Radio/Merlin | 21455me | 21515af | |
| 1100 1200 | vi Australia, ABC/Alice Springs | 2485do | | 1100 1200 | | Ukraine, R Ukraine International | 21520au | | |
| 1100 1200 | vi Australia, ABC/Katherine | 2325do | | 1100 1200 | | USA, Arme Forces Network | 4278am | 6458am | 12689am |
| 1100 1200 | vi Australia, ABC/Tennant Creek | 5995pa 6020pa 9580va 13605pa | | 1100 1200 | | USA, KAJI Dallas TX | 5755va | | |
| 1100 1200 | Australia, Radio | 21820as | | 1100 1200 | | USA, KTBN Salt Lake City UT | 7510na | | |
| | | 7255do | | 1100 1200 | | USA, KWHR Naalehu HI | 9930as | 11565as | |
| 1100 1200 | vi Botswana, Radio | 15700eu | 7255do | 1100 1200 | | USA, Voice of America | 6160as | 9645as | 9760as 9770pa |
| 1100 1200 | vi Bulgaria, Radio | 4850do | 17500eu | | | | 15160as | 15240as | 15425as |
| 1100 1200 | vi Cameroon, RTV/Yaounde | 9625do | | 1100 1200 | | USA, WEWN Birmingham AL | 7425na | 15745eu | |
| 1100 1200 | Canada, CBC Northern Service | 6070do | | 1100 1200 | | USA, WHRI Noblesville IN | 6040na | 9495sa | |
| 1100 1200 | Canada, CFRX Toronto ON | 6030do | | 1100 1200 | | USA, WJCR Upton KY | 7490va | 13595as | |
| 1100 1200 | Canada, CFVP Calgary AB | 6160do | | 1100 1200 | | USA, WRNO New Orleans LA | 7395na | | |
| 1100 1200 | Canada, CKZN St John's NF | 6160do | | 1100 1200 | | USA, WSHB Cypress Crk SC | 6095am | 11660am | |
| 1100 1200 | Canada, CKZU Vancouver BC | 9640na 13650na 17765na 17820na | | 1100 1200 | | USA, WTJC Newport NC | 9370na | | |
| 1100 1200 | mtwhf Canada, R Canada International | 6970va | | 1100 1200 | | USA, WWCN Nashville TN | 5070na | 5935na | 7435na 15685na |
| 1100 1200 | as Costa Rica, R for Peace Intl | 5030am 11870va 13749af | 6150va 7375na 9725na | 1100 1200 | | USA, WYFR Okeechobee FL | 5850na | 5950na | |
| 1100 1200 | Costa Rica, University Network | 12005am | 15115am | 1100 1200 | vi/s | Vanuatu, Radio | 3945do | 4960do | 7260do |
| | | 15185af | | 1100 1200 | | Zambia, Christian Voice | 9865do | | |
| 1100 1200 | mtwhf Ecuador, HCJB | 15185af | 21455usb | 1100 1200 | vi | Zambia, National BC Corp | 6165do | 6265do | |
| 1100 1200 | as/vl Eqt Guinea, Radio Africa | 5850eu | | 1100 1200 | vi | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | |
| 1100 1200 | Germany, Overcomer Ministries | 21590me | | 1110 1120 | | Greece, Voice of | 9420va | 15630va | |
| 1100 1200 | Germany, Voice of Hope | 6130do | 4915do | 1115 1145 | | Nepal, Radio | 5005as | 7165as | |
| 1100 1200 | vi Ghana, Ghana BC Corp | 4915do | 4915do | 1120 1140 | w | Kzakhstan, Radio Almaty | 9620eu | 11840eu | |
| 1100 1200 | vi/as Ghana, Ghana BC Corp | 5949do | | 1130 1145 | vi | Libya, Voice of Africa | 11815af | 15415af | 17725va |
| 1100 1200 | Guyana, Voice of | 15385as | 15430as 15585as 21470as | 1130 1156 | | Belgium, Radio Vlaanderen Intl | 9865as | 9925eu | |
| 1100 1200 | Iran, VOIRI | 21730as | | 1130 1157 | | Czech Rep, Radio Prague Intl | 6055eu | 21745as | |
| | | 7120va | | 1130 1200 | | Netherlands, Radio | 6045eu | 9860eu | |
| 1100 1200 | Italy, IRRS | 6120na | 9695as 15590as | 1130 1200 | | Sri Lanka, Sri Lanka BC Corp | 4940do | | |
| 1100 1200 | Japan, Radio | 17680eu | | 1130 1200 | | Sweden, Radio | 18960na | | |
| 1100 1200 | Jordan, Radio | 7125do | 7150do 7210do | 1130 1200 | f | USA, WRMI Miami FL | 9955am | | |
| 1100 1200 | Kenya, Kenya BC Corp | 4800do | | 1130 1200 | | Vatican City, Vatican Radio | 15595va | 17515va | |
| 1100 1200 | vi Lesotho, Radio | | | 1140 1200 | t | Kzakhstan, Radio Almaty | 9620eu | 11840eu | |
| | | | | 1145 1200 | | Germany, Deutsche Welle | 6140eu | | |

SELECTED PROGRAMS

Daily

- 1100 R. Australia: News
1130 USA, VOA News Now: World News

Sunday

- 1105 R. Australia: Jazz Notes (Australian jazz performers/performances)
1105 R. New Zealand Int.: Sportsworld (hour-long report on NZ)
1130 R. Australia: In Conversation (interviews w/Zoe Daniel)
1133 USA, VOA News Now: Women in Business [2nd Sun. only]
1133 USA, VOA News Now: Kaleidoscope (aspects of American culture w/Susan Logue)[exc. 2nd Sun.]

Monday-Friday

- 1100 USA, VOA News Now: World News
1105 R. Australia: Asia Pacific (regional current events analysis)
1110 UK, BBCWS Americas stream: Caribbean Sport
1110 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
1114 USA, VOA News Now: US News
1118 USA, VOA News Now: Sports (reports/scores)
1118 USA, VOA News Now: Sports (reports/scores)
1122 USA, VOA News Now: US feature (a report about the US)
1130 R. Australia: Sport (reports/scores)
1130 R. Australia: Sport (reports/scores)
1135 R. Australia: Life Matters (Australian family life issues)
1136 USA, VOA News Now: Dateline (news background/analysis)
1145 UK, BBCWS S. Asia stream: Sports Roundup (British) M-Th

- 1145 R. Sweden: Sportscan (reports/scores from Scandinavia) M only
1145 USA, VOA News Now: Science, Medicine and the Environment
1149 USA, VOA News Now: Business and Economic News
1154 USA, VOA News Now: General feature report (a topical report)

Monday-Saturday

- 1145 UK, BBCWS Americas stream: Sports Roundup (British/world reports)
1145 UK, BBCWS Eu/N.Africa stream: Sports Roundup (British/world reports/scores)
1145 UK, BBCWS W/Cntrl Africa stream: Sports Roundup (British/world reports/scores)

Tuesday

- 1120 R. Bulgaria: Sports (weekend results in Europe/Bulgaria)
1148 Belgium, R. Vlaanderen Int.: Sports (Belgian/European reports/scores from weekend)

Wednesday

- 1105 UK, BBCWS E.As/Aus/Pac stream: Focus on Football (how soccer is developing globally)[Sust wk.]
1105 UK, BBCWS E.As/Aus/Pac stream: Sports International (issues/people behind headlines)[exc. Sust wk.]

Thursday

- 1105 UK, BBCWS E./S.Africa stream: Focus on Football (how soccer is developing globally)[Sust wk.]

- 1105 UK, BBCWS E./S.Africa stream: Sports International (issues/people behind headlines)[exc. Sust wk.]

Friday

- 1145 UK, BBCWS S. Asia stream: Football Extra (weekly global soccer report)

Saturday

- 1105 R. New Zealand Int.: The World in Sport (interviews/the week's results)
1105 R. Australia: Book Reading (from Australian literature)
1115 R. Australia: Lingua Franca (discussions about language)
1130 R. Australia: Fine Music Australia (Australian classical music compositions/performers)
1133 USA, VOA News Now: Our World (science/technology/agriculture w/Rob Sivak)

Saturday-Sunday

- 1100 USA, VOA News Now: World News
1110 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
1114 USA, VOA News Now: US News
1118 USA, VOA News Now: Sports (reports/scores)
1118 USA, VOA News Now: Sports (reports/scores)
1122 USA, VOA News Now: US feature (a report about the US)



FREQUENCIES

| | | | | | | | | | | | | | | | | |
|------|------|-------|------------------------------------|---------|---------|----------|---------|--|------|------|-------|----------------------------------|---------|---------|---------|---------|
| 1200 | 1220 | as | UK, BBC World Service | 6195na | 15220am | | | | 1200 | 1300 | vl | Nigeria, Radio/Enugu | 6025do | | | |
| 1200 | 1225 | mtwtf | Moldova, Radio Moldova Intl | 15315na | | | | | 1200 | 1300 | vl | Nigeria, Radio/Ibadan | 6050do | | | |
| 1200 | 1230 | | Canada, R Canada International | 9640na | 9660as | 13650na | 15195as | | 1200 | 1300 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| | | | | 17765na | 17820na | | | | 1200 | 1300 | vl | Nigeria, Radio/Lagos | 4990do | 7285do | | |
| 1200 | 1230 | | Iran, VOIRI | 15385as | 15430as | 15585as | 21470as | | 1200 | 1300 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 13840as |
| | | | | 21730as | | | | | 1200 | 1300 | vl | Papua New Guinea, NBC | 4890do | 9675do | | |
| 1200 | 1230 | | Netherlands, Radio | 6045eu | 9860eu | | | | 1200 | 1300 | | Sierra Leone, Sierra Leone BS | 5980do | | | |
| 1200 | 1230 | | Sri Lanka, Sri Lanka BC Corp | 4940do | | | | | 1200 | 1300 | | Singapore, R Singapore Intl | 6150as | 9590as | | |
| 1200 | 1230 | | Switzerland, Swiss R International | 15315eu | | | | | 1200 | 1300 | | Taiwan, R Taiwan International | 7130as | 9610au | | |
| 1200 | 1230 | | Uzbekistan, Radio Tashkent | 7285as | 9715as | 15295as | 17775as | | 1200 | 1300 | | Uganda, Radio | 5026do | 7110do | 7196do | |
| 1200 | 1245 | | USA, WYFR Okeechobee FL | 5850na | 5950na | 17750na | | | 1200 | 1300 | | UK, BBC World Service | 5965na | 6190af | 6195as | 9515na |
| 1200 | 1255 | | Poland, Radio Polonia | 6095eu | 7270eu | 9525eu | 11820eu | | | | | 5980as | 9740as | 11760me | 11940af | |
| 1200 | 1256 | | China China Radio International | 9715as | 9760pa | 11675pa | 11980as | | | | | 11955as | 12095eu | 15280as | 15310as | |
| | | | | 15415as | | | | | | | | 15485eu | 15565eu | 15575me | 17640eu | |
| 1200 | 1256 | | North Korea, R Pyongyang | 3560va | 9640va | 9850va | 9975va | | 1200 | 1300 | a | UK, Virgin Radio/Merlin | 17700as | 17830af | 17885af | 21470af |
| | | | | 11335va | 13650va | | | | 1200 | 1300 | | USA, Armed Forces Network | 21455me | 21515af | | |
| 1200 | 1300 | | Anguilla, Caribbean Beacon | 11775am | | | | | 1200 | 1300 | | USA, KALM Dallas TX | 4278am | 6458am | 12689am | |
| 1200 | 1300 | vl | Australia, ABC/Alice Springs | 2310do | | | | | 1200 | 1300 | | USA, KTNB Salt Lake City UT | 13815va | | | |
| 1200 | 1300 | vl | Australia, ABC/Katherine | 2485do | | | | | 1200 | 1300 | | USA, KWHR Naalehu HI | 7510na | | | |
| 1200 | 1300 | vl | Australia, ABC/Tennant Creek | 2325do | | | | | 1200 | 1300 | | USA, Voice of America | 9930as | 11565pa | | |
| 1200 | 1300 | | Australia, Radio | 5995pa | 6020pa | 9580va | 11650pa | | 1200 | 1300 | | | 6160as | 9645as | 9760as | 15160as |
| | | | | 21820as | | | | | | | | 15240as | 15425as | | | |
| 1200 | 1300 | mtwhf | Bhutan, Bhutan BC Service | 5030do | | | | | 1200 | 1300 | | USA, WEWN Birmingham AL | 7425na | 15745eu | | |
| 1200 | 1300 | vl | Botswana, Radio | 7255do | 9600do | 7255do | | | 1200 | 1300 | mtwhf | USA, WGTG McCaysville GA | 9400va | 12172am | | |
| 1200 | 1300 | | Brazil, Radio Nacional Bras | 15445am | | | | | 1200 | 1300 | | USA, WHRI Noblesville IN | 6040na | 9495sa | | |
| 1200 | 1300 | vl | Cameroon, RTV/Yaounde | 4850do | | | | | 1200 | 1300 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 1200 | 1300 | vl | Canada, CBC Northern Service | 9625do | | | | | 1200 | 1300 | | USA, WRMI Miami FL | 9955am | | | |
| 1200 | 1300 | | Canada, CFRX Toronto ON | 6070do | | | | | 1200 | 1300 | | USA, WRNO New Orleans LA | 7395na | | | |
| 1200 | 1300 | | Canada, CFVP Calgary AB | 6030do | | | | | 1200 | 1300 | | USA, WSHB Cypress Crk SC | 6095am | 11660am | | |
| 1200 | 1300 | | Canada, CKZN St John's NF | 6160do | | | | | 1200 | 1300 | | USA, WTJC Newport NC | 9370na | | | |
| 1200 | 1300 | | Canada, CKZU Vancouver BC | 6160do | | | | | 1200 | 1300 | | USA, WWCN Nashville TN | 5070na | 7435na | 13845na | 15685na |
| 1200 | 1300 | | Costa Rica, R for Peace Intl | 6970va | | | | | 1200 | 1300 | vl/s | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 1200 | 1300 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | 1200 | 1300 | | Zambia, Christian Voice | 9865do | | | |
| | | | | 11870va | 13749af | | | | 1200 | 1300 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 1200 | 1300 | | Ecuador, HCJB | 12005am | 15115am | 21455usb | | | 1200 | 1300 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 1200 | 1300 | as/vl | Eqt. Guinea, Radio East Africa | 15185af | | | | | 1204 | 1220 | mtwhf | UK, BBC Caribbean Report | 6195ca | 15220ca | | |
| 1200 | 1300 | | France, R France International | 11670eu | 15155eu | 15195af | 15540af | | 1205 | 1210 | | Croatia, Croatian Radio | 6165eu | 9830eu | 13830eu | |
| 1200 | 1300 | | Germany, Deutsche Welle | 6140eu | | | | | 1215 | 1300 | | Egypt, Radio Cairo | 17595as | | | |
| 1200 | 1300 | | Germany, Overcomer Ministries | 5850eu | | | | | 1220 | 1300 | mtwhf | UK, BBC World Service | 15220am | | | |
| 1200 | 1300 | | Germany, Voice of Hope | 21460me | | | | | 1230 | 1257 | | Vietnam, Voice of | 9839as | 12019as | | |
| 1200 | 1300 | vl | Ghana, Ghana BC Corp | 4915do | 6130do | | | | 1230 | 1259 | | Canada, R Canada International | 9640na | 13650na | 17765na | 17820na |
| 1200 | 1300 | | Guyana, Voice of | 5949do | | | | | 1230 | 1300 | | Austria, R Austria International | 6155eu | 13730va | | |
| 1200 | 1300 | vl/as | Italy, IRRS | 7120va | | | | | 1230 | 1300 | | Bangladesh, Bangla Betar | 7184as | 9558as | | |
| 1200 | 1300 | | Jordan, Radio | 11690eu | | | | | 1230 | 1300 | | Guam, Adventist World Radio | 15330va | | | |
| 1200 | 1300 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | | | 1230 | 1300 | | Italy, Adventist World Radio | 9610eu | | | |
| 1200 | 1300 | vl | Lesotho, Radio | 4800do | | | | | 1230 | 1300 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as | 9770as |
| 1200 | 1300 | vl | Liberia, ELWA | 4760do | | | | | | | | 15425as | | | | |
| 1200 | 1300 | vl | Liberia, R Liberia International | 6100do | | | | | 1230 | 1300 | | Sweden, Radio | 17505as | 18960na | 21810as | |
| 1200 | 1300 | | Malaysia, Radio | 7295do | | | | | 1230 | 1300 | | Thailand, Radio | 9655as | 9885as | 11905as | |
| 1200 | 1300 | | N Marianas, KHBI Saipan | 11550as | | | | | 1230 | 1300 | | Turkey, Voice of | 17830as | 21540eu | | |
| 1200 | 1300 | | Namibia, Namibian BC Corp | 7165af | 7215af | | | | 1230 | 1300 | a | UK, Wales Radio Intl/Merlin | 17650au | | | |
| 1200 | 1300 | | New Zealand, R New Zealand Int | 11720va | | | | | 1245 | 1300 | f | Seychelles, FEBA Radio | 15535me | | | |
| 1200 | 1300 | | New Zealand, ZLXA | 3935do | | | | | | | | | | | | |

SELECTED PROGRAMS

Daily

1200 China R. Int.: News
1200 R. Australia: News
1200 USA, VOA: News Now: World News
1210 USA, VOA: News Now Regional News (news from the regions to
which VOA is broadcasting)
1214 USA, VOA: News Now: US News
1218 USA, VOA: News Now: Sports (reports/scores)
1218 USA, VOA: News Now: Sports (reports/scores)
1222 USA, VOA: News Now: US feature (a report about the US)
1230 USA, VOA: News Now: World News

Sunday

1205 R. Australia: Country Club (contemporary/ traditional country
music)[to 1400]
1210 China R.: Int. Report on Developing Countries (news/reports from)
1220 China R. Int.: In the Spotlight (cultural magazine)
1233 USA, VOA: News Now Encounter (two experts debate contra-
ing views)

Monday

1230 China R. Int.: People in the Know (magazine on people modern-
izing China)
1240 R. France Int.: Sports (reports/scores of French sports)
1245 R. Sweden: Sportscan (reports/scores of events in Scandinavia)

Monday-Friday

1205 Ecuador, HCJB: Sports News
1205 R. Australia: Late Night Live (topical political/cultural/philosophical
issues w/Phillip Adams)
1210 China R. Int.: Current Affairs (world/domestic correspondents' reports)
1245 USA, VOA News Now: Science, Medicine and the Environment
1249 USA, VOA News Now: Business and Economic News
1254 USA, VOA News Now: Music feature

Tuesday

1205 R. Australia: Late Night Live (topical political/cultural/philosophical
issues w/Phillip Adams)
1230 China R. Int.: Sports World (magazine of sports and China)
1230 China R. Int.: Sports World (magazine of sports and China)
1252 R. France Int.: Sports (reports/scores of French sports) Tu/W/F

Wednesday

1205 R. Australia: Late Night Live (topical political/cultural/philosophical
issues w/Phillip Adams)

1230 China R. Int.: China Horizons (business/economic development maga-
zine)

Thursday

1205 R. Australia: Late Night Live (topical political/cultural/philosophical issues w/Phillip Adams)

1230 China R. Int.: Voices from Other Lands (China thru eyes of visitors)
1230 R. France Int.: Sports (reports/scores of French sports)

Friday

1205 R. Australia: Sound Quality (innovations in contemporary music
w/Tim Ritchie)

1230 China R. Int.: Life in China (magazine of everyday life)

1205 R. Australia: Spirit of Things (the contemporary religious experi-
ence)

1210 China R. Int.: Global Review (weekly comment/analyses)

1220 China R. Int.: Listeners' Garden (listener letters/interactive fea-
tures)

1233 USA, VOA News Now: Press Conference USA (w/American/fore-
ign correspondents)



FREQUENCIES

| | | | | | | | | | | | | | | | |
|------|------|--------|----------------------------------|---------|---------|----------|---------|------|------|---------|--------------------------------|---------|---------|---------|---------|
| 1300 | 1305 | | New Zealand, R New Zealand Int | 11720va | | | | 1300 | 1400 | vl | Papua New Guinea, NBC | 4890do | 9675do | | |
| 1300 | 1315 | smtwhf | USA, WRMI Miami FL | 9955am | | | | 1300 | 1400 | as | S Africa, Channel Africa | 11720af | 17780af | 21725af | |
| 1300 | 1320 | | Brazil, Radio Nacional Bras | 15445am | | | | 1300 | 1400 | | Sierra Leone, Sierra Leone BS | 5980do | | | |
| 1300 | 1329 | | Czech Rep, Radio Prague Intl | 13580eu | 17485as | | | 1300 | 1400 | | Singapore, R Singapore Intl | 6150as | 9590as | | |
| 1300 | 1330 | | Egypt, Radio Cairo | 17595as | | | | 1300 | 1400 | | South Korea, R Korea Intl | 9570as | 9640om | 13670as | |
| 1300 | 1330 | s | Germany, Universal Life | 9710eu | 9955na | | | 1300 | 1400 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as | 9770as |
| 1300 | 1330 | | Germany, Voice of Hope | 21460me | | | | | | | | 15425as | | | |
| 1300 | 1330 | | Kenya, Kenya BC Corp | 7125do | 7150do | 7210do | | 1300 | 1400 | | Uganda, Radio | 4976do | 5026do | | |
| 1300 | 1330 | | Turkey, Voice of | 17830as | 21540eu | | | 1300 | 1400 | | UK, BBC World Service | 5965na | 5990as | 6190af | 6195va |
| 1300 | 1356 | | China China Radio International | 7405na | 9570na | 11675pa | 11900pa | | | | | 9515na | 9740as | 11760me | 11865na |
| | | | | 11980as | | | | | | | | 11940af | 12095eu | 15220am | 15310as |
| 1300 | 1356 | | Romania, R Romania International | 15250na | 15390eu | 17770eu | 17790na | | | | | 15420af | 15485eu | 15565eu | 15575me |
| 1300 | 1400 | | Anguilla, Caribbean Beacon | 11775am | | | | | | | | 17640eu | 17700as | 17830af | 17885af |
| 1300 | 1400 | vl | Australia, ABC/Alice Springs | 2310do | | | | 1300 | 1400 | a | UK, Global Kitchen/Merlin | 21470af | | | |
| 1300 | 1400 | vl | Australia, ABC/Katherine | 2485do | | | | 1300 | 1400 | a | UK, Virgin Radio/Merlin | 9750eu | 12005eu | 15235eu | |
| 1300 | 1400 | vl | Australia, ABC/Tennant Creek | 2325do | | | | 1300 | 1400 | | USA, Armed Forces Network | 21455me | 21515af | | |
| 1300 | 1400 | | Australia, Radio | 5995pa | 6020pa | 9580va | 11650pa | 1300 | 1400 | | USA, KAIJ Dallas TX | 4278am | 6458am | 12689am | |
| | | | | 21820as | | | | 1300 | 1400 | | USA, KJES Vado NM | 13815va | | | |
| 1300 | 1400 | vl | Botswana, Radio | 7225do | 9600do | 7255do | | 1300 | 1400 | | USA, KNLS Anchor Point AK | 11715na | | | |
| 1300 | 1400 | vl | Cameroon, RTV/Yaounde | 4850do | | | | 1300 | 1400 | | USA, KTNB Salt Lake City UT | 9615as | | | |
| 1300 | 1400 | vl | Canada, CBC Northern Service | 9625do | | | | 1300 | 1400 | | USA, KWHR Naalehu HI | 7510na | | | |
| 1300 | 1400 | | Canada, CFRX Toronto ON | 6070do | | | | 1300 | 1400 | | USA, Voice of America | 9930as | 11565pa | | |
| 1300 | 1400 | | Canada, CFVP Calgary AB | 6030do | | | | 1300 | 1400 | | | 6160as | 9645as | 9760as | 15160as |
| 1300 | 1400 | | Canada, CKZN St John's NF | 6160do | | | | | | | | 15425as | | | |
| 1300 | 1400 | | Canada, CKZU Vancouver BC | 6160do | | | | 1300 | 1400 | | USA, WEWN Birmingham AL | 11875na | 15745eu | | |
| 1300 | 1400 | smtwhf | Canada, R Canada International | 13650na | | | | 1300 | 1400 | mtwhf | USA, WGTG McCaysville GA | 9400va | 12172am | | |
| 1300 | 1400 | s | Canada, R Canada International | 17800na | | | | 1300 | 1400 | | USA, WHRI Noblesville IN | 6040na | 15105sa | | |
| 1300 | 1400 | mtwhf | Canada, R Canada International | 9640na | 11795na | 17820na | | 1300 | 1400 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 1300 | 1400 | | Costa Rica, R for Peace Intl | 15049va | | | | 1300 | 1400 | | USA, WRNO New Orleans LA | 7395na | | | |
| 1300 | 1400 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 1300 | 1400 | | USA, WSHB Cypress Crk SC | 9430am | 9455na | | |
| | | | | 11870va | 13749af | | | 1300 | 1400 | | USA, WTJC Newport NC | 9370na | | | |
| 1300 | 1400 | | Ecuador, HCJB | 12005am | 15115am | 21455usb | | 1300 | 1400 | | USA, WWCR Nashville TN | 9475na | 12160na | 13845na | 15685na |
| 1300 | 1400 | as/vl | Eq. Guinea, Radio East Africa | 15185af | | | | 1300 | 1400 | | USA, WYFR Okeechobee FL | 11550as | 11830na | 11970na | 17750na |
| 1300 | 1400 | | Germany, Deutsche Welle | 6140eu | | | | 1300 | 1400 | | Zambia, Christian Voice | 9865do | | | |
| 1300 | 1400 | | Germany, Overcomer Ministries | 5850eu | 13810eu | | | 1300 | 1400 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 1300 | 1400 | vl | Ghana, Ghana BC Corp | 4915do | 6130do | | | 1300 | 1400 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 1300 | 1400 | | Guyana, Voice of | 5949do | | | | 1306 | 1400 | occsnal | New Zealand, R New Zealand Int | 6100va | | | |
| 1300 | 1400 | vl/as | Italy, IRRS | 7120va | | | | 1315 | 1400 | s | USA, WRMI Miami FL | 9955am | | | |
| 1300 | 1400 | | Jordan, Radio | 11690eu | | | | 1330 | 1357 | | Vietnam, Voice of | 9730eu | 13740eu | | |
| 1300 | 1400 | vl | Lesotho, Radio | 4800do | | | | 1330 | 1400 | | Australia, Radio | 5995pa | 6020pa | 9475as | 9580va |
| 1300 | 1400 | vl | Liberia, ELWA | 4760do | | | | | | | | 11650pa | 11660va | 21820as | |
| 1300 | 1400 | vl | Liberia, R Liberia International | 6100do | | | | 1330 | 1400 | | Canada, R Canada International | 9535as | 17795as | | |
| 1300 | 1400 | | Malaysia, Radio | 7295do | | | | 1330 | 1400 | | Germany, Voice of Hope | 15715as | 17550af | 21460me | |
| 1300 | 1400 | | N Marianos, KHBI Saipan | 9940as | | | | 1330 | 1400 | | Guam, Adventist World Radio | 11705as | 11750as | | |
| 1300 | 1400 | | Namibia, Namibian BC Corp | 7165af | 7215af | | | 1330 | 1400 | | India, All India Radio | 9710as | 11620as | 13710as | |
| 1300 | 1400 | | New Zealand, ZLXA | 3935do | | | | 1330 | 1400 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | |
| 1300 | 1400 | vl | Nigeria, Radio/Enugu | 6025do | | | | 1330 | 1400 | | Sweden, Radio | 17505va | 18960na | 21810as | |
| 1300 | 1400 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do | 1330 | 1400 | | UAE, Radio Dubai | 13675eu | 15395eu | 21605eu | |
| 1300 | 1400 | vl | Nigeria, Radio/Lagos | 4990do | 7285do | | | 1330 | 1400 | | Uzbekistan, Radio Tashkent | 7285as | 9715as | 15295as | 17775as |
| 1300 | 1400 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 13840as | 1345 | 1400 | | Vatican City, Vatican Radio | 17515au | 21620au | | |

SELECTED PROGRAMS

Daily

1300 China R. Int.: News
1300 R. Australia: News
1300 USA, VOA News Now: World News
1310 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
1314 USA, VOA News Now: US News
1318 USA, VOA News Now: Sports (reports/scores)
1318 USA, VOA News Now: Sports (reports/scores)
1322 USA, VOA News Now: US feature (a report about the US)
1330 USA, VOA News Now: World News

Sunday

1305 R. Australia: Country Club [cont'd from 1205]
1310 China R. Int.: Report on Developing Countries (news/reports from)
1320 China R. Int.: In the Spotlight (cultural magazine)
1333 USA, VOA News Now: Issues in the News (discussions w/Wash-
ington press)
1350 All India R.: Sports Round-up (reports/interviews/Indian sport) (1st
Su)

Monday

1330 China R. Int.: People in the Know (magazine on people modern-
izing China)
1345 R. Sweden: Sportscan (reports/scores of events in Scandinavia)

Monday-Friday

1310 China R. Int.: Current Affairs (world/domestic correspondents' reports)

1315 R. Australia: The Planet (richly varied music from around the world
w/Lucky Oceans)[to 1500]
1336 USA, VOA News Now: Dateline (news background/analysis)
1345 USA, VOA News Now: Science, Medicine and the Environment
1349 USA, VOA News Now: Business and Economic News
1350 UK, BBCWS E.s/Aus/Pac stream: Sports Roundup (British/world
reports/scores)
1354 USA, VOA News Now: General feature report (a topical report)

Tuesday

1330 China R. Int.: Sports World (magazine of sports and China)
1330 China R. Int.: Sports World (magazine of sports and China)

Wednesday

1330 China R. Int.: China Horizons (business/economic development magazine)

Thursday

1305 UK, BBCWS Mideast/CIS stream: Sports International (issues/people
behind headlines)[exc. Sust wk.]

1305 UK, BBCWS Mideast/CIS stream: Focus on Football (how soccer is
developing globally)[Sust wk.]

1315 Guam, KSDA: Between the Lines w/Don Pate (weekly sports report)

1330 China R. Int.: Voices from Other Lands (China thru eyes of visitors)

Friday

1330 China R. Int.: Life in China (magazine of everyday life)

Saturday

1305 R. Australia: Science Show (science Australia and abroad)
1310 China R. Int.: Global Review (weekly comment/analyses)
1320 China R. Int.: Listeners' Garden (listener letters/interactive features)
1333 USA, VOA News Now: Communications World (worldwide broadcast/electronic media w/Kim Elliot)

Hauser's Highlights

AUSTRALIA: R. Australia

Olympic coverage from ABC-702 Sydney daily
for 16 days starting Sept. 16

11650 kHz to Pacific:

UTC 2100-17715

0000-17580

0200- 13605

0800-conclusion

11650 kHz to Asia, updates only:

UTC 0030. 0330. 0530. 0730. 1130

(RA Feedback)



FREQUENCIES

| | | | | | | | | | |
|-------------------|----------------------------------|---------|---------|--------------|------------------------------------|---------|---------|---------|---------|
| 1400 1405 | Vatican City, Vatican Radio | 17515au | 21620au | 1400 1500 vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| 1400 1430 | Israel, Kol Israel | 15650va | 17535va | 1400 1500 vl | Nigeria, Radio/Lagos | 4990do | 7285do | | |
| 1400 1430 | Mexico, R Mexico International | 5985am | 9705am | 1400 1500 | Oman, Radio Sultanate of | 15140va | | | |
| 1400 1430 | Thailand, Radio | 9655as | 9830as | 1400 1500 | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 13840as |
| 1400 1430 s | USA, Voice of America | 18275va | | 1400 1500 | Russia, Voice of Russia WS | 11695as | 11720as | 12055me | |
| 1400 1455 as | S Africa, Channel Africa | 11720af | 17780af | 1400 1500 | Sierra Leone, Sierra Leone BS | 5980do | | | |
| 1400 1456 | China China Radio International | 7405na | 9700as | 1400 1500 | Singapore R Corp of Singapore | 6150do | | | |
| | | 13685af | 15110as | 1400 1500 | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as | 9770as |
| | | | 15125af | | | 15425as | | | |
| 1400 1500 | Anguilla, Caribbean Beacon | 11775am | | 1400 1500 | Switzerland, Swiss R International | 9575as | 17670as | | |
| 1400 1500 vl | Australia, ABC/Alice Springs | 2310do | | 1400 1500 | Taiwan, R Taiwan International | 15125as | | | |
| 1400 1500 vl | Australia, ABC/Katherine | 2485do | | 1400 1500 | Uganda, Radio | 4976do | 5026do | | |
| 1400 1500 vl | Australia, ABC/Tennant Creek | 2325do | | 1400 1500 | UK, BBC World Service | 5990as | 6190af | 6195as | 9515na |
| 1400 1500 | Australia, Radio | 5995as | 6080va | | | 9740as | 11865na | 11940af | 12095eu |
| | | 11650pa | 11660as | | | 15220na | 15310as | 15485eu | 15565eu |
| | | | 9600do | | | 15575me | 17640as | 17700as | 17830af |
| | | | 7255do | | | 17840am | 21470af | 21660af | |
| 1400 1500 vl | Botswana, Radio | 7255do | | 1400 1500 a | UK, Global Kitchen/Merlin | 9750eu | 12005eu | 15235eu | |
| 1400 1500 vl | Cameroon, RTV/Yaounde | 4850do | | 1400 1500 a | UK, Virgin Radio/Merlin | 21455me | | | |
| 1400 1500 vl | Canada, CBC Northern Service | 9625do | | 1400 1500 | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 1400 1500 | Canada, CFRX Toronto ON | 6070do | | 1400 1500 | USA, KALJ Dallas TX | 13815va | | | |
| 1400 1500 | Canada, CFVP Calgary AB | 6030do | | 1400 1500 | USA, KJES Vado NM | 11715na | | | |
| 1400 1500 | Canada, CKZN St John's NF | 6160do | | 1400 1500 | USA, KTBN Salt Lake City UT | 7510na | | | |
| 1400 1500 | Canada, CKZU Vancouver BC | 6160do | | 1400 1500 | USA, KWHR Naalehu HI | 9930as | 11565as | 7125as | 9645as |
| 1400 1500 s | Canada, R Canada International | 13650na | 17800na | 1400 1500 | USA, Voice of America | 6160as | 7125as | 9645as | 9760as |
| 1400 1500 | Costa Rica, R for Peace Intl | 15049va | | | | 15160as | 15255va | 15425as | |
| 1400 1500 | Costa Rica, University Network | 5030am | 6150va | | | 11875na | 15745eu | | |
| | | 11870va | 13749af | | | 12172am | | | |
| | | | 15115am | | | 9400va | | | |
| 1400 1500 | Ecuador, HCJB | 12005am | | 1400 1500 | USA, WGTG McCaysville GA | 6040na | 15105sa | | |
| 1400 1500 as/vl | Eqt. Guinea, Radio East Africa | 15185af | | 1400 1500 | USA, WGTG McCaysville GA | 7490va | 13595as | | |
| 1400 1500 | France, R France International | 11610as | 17620va | 1400 1500 | USA, WHRI Noblesville IN | 9955am | | | |
| 1400 1500 | Germany, Deutsche Welle | 6140eu | 17680as | 1400 1500 | USA, WRMI Miami FL | 7395na | | | |
| 1400 1500 | Germany, Overcomer Ministries | 5850eu | 13810eu | 1400 1500 | USA, WRNO New Orleans LA | 9370na | | | |
| 1400 1500 | Germany, Voice of Hope | 15715as | 17550af | 1400 1500 | USA, WTJC Newport NC | 9475na | | | |
| 1400 1500 vl | Ghana, Ghana BC Corp | 4915do | 6130do | 1400 1500 | USA, WWCR Nashville TN | 11550as | | | |
| 1400 1500 | Guyana, Voice of | 5949do | | 1400 1500 | USA, WYFR Okeechobee FL | 9865do | | | |
| 1400 1500 | India, All India Radio | 9710as | 11620as | 1400 1500 vl | Zambia, Christian Voice | 6165do | 6265do | | |
| 1400 1500 vl/as | Italy, IRRS | 7120va | 13710as | 1400 1500 vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 1400 1500 | Japan, Radio | 9505na | 9860as | 1415 1420 | Nepal, Radio | 5005as | 7165as | | |
| | | | 11730as | 1430 1500 | Guam, Adventist World Radio | 9355as | | | |
| | | | 11880me | 1430 1500 | Guam, Trans World Radio | 15330as | | | |
| 1400 1500 | Jordan, Radio | 11690eu | | 1430 1500 | Malaysia, RTM Kota Kinabalu | 5980do | | | |
| 1400 1500 | Kenya, Kenya BC Corp | 4885do | 4915do | 1430 1500 | Myanmar, Radio | 5985do | | | |
| 1400 1500 vl | Lesotho, Radio | 4800do | 4935do | 1430 1500 | Netherlands, Radio | 9890as | 12065as | 15590as | |
| 1400 1500 vl | Liberia, ELWA | 4760do | | 1430 1500 | Slovakia, Adventist World Radio | 17525as | | | |
| 1400 1500 vl | Liberia, R Liberia International | 6100do | | 1445 1500 | USA, WINB, Red Lion PA | 13570am | | | |
| 1400 1500 | Malaysia, Radio | 7295do | | | | | | | |
| 1400 1500 | Malaysia, RTM Sarawak | 7160do | | | | | | | |
| 1400 1500 | Namibia, Namibian BC Corp | 7165af | 7215af | | | | | | |
| 1400 1500 occsnal | New Zealand, R New Zealand Int | 6100va | | | | | | | |
| 1400 1500 | New Zealand, ZLXA | 3935do | | | | | | | |
| 1400 1500 vl | Nigeria, Radio/Enugu | 6025do | | | | | | | |
| 1400 1500 vl | Nigeria, Radio/Ibadan | 6050do | | | | | | | |

SELECTED PROGRAMS

Daily

- 1400 China R. Int.: News
1400 R. Australia: News
1400 USA, VOA News Now: World News
1410 USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting)
1414 USA, VOA News Now: US News
1418 USA, VOA News Now: Sports (reports/scores)
1418 USA, VOA News Now: Sports (reports/scores)
1422 USA, VOA News Now: US feature (a report about the US)
1430 USA, VOA News Now: World News

Sunday

- 1405 R. Australia: Books and Writing (Australian writers/books/publishing industry)
1410 China R. Int.: Report on Developing Countries (news/reports from)
1420 China R. Int.: In the Spotlight (cultural magazine)
1433 USA, VOA News Now: Best of "Talk to America" (highlights from daily phone-in)

Monday

- 1430 China R. Int.: People in the Know (magazine on people modernizing China)
1445 R. France Int.: Sports (reports/scores of French sports)

Monday-Friday

- 1405 R. Australia: The Planet [cont'd from 1315]

- 1410 China R. Int.: Current Affairs (world/domestic correspondents' reports)
1445 UK, BBCWS Mideast/CIS stream: Sports Roundup (British/world reports/scores)
1445 UK, BBCWS E.As/Aus/Pac stream: Sports Roundup (British/world reports/scores)
1445 USA, VOA News Now: Science, Medicine and the Environment
1449 USA, VOA News Now: Business and Economic News
1454 USA, VOA News Now: Music feature
1445 UK, BBCWS E./S.Africa stream: Sports Roundup (British/world reports/scores) M-Th

Tuesday

- 1430 China R. Int.: Sports World (magazine of sports and China)
1430 China R. Int.: Sports World (magazine of sports and China)
1452 R. France Int.: Sports (reports/scores of French sports)

Wednesday

- 1430 China R. Int.: China Horizons (business/economic development)
1452 R. France Int.: Sports (reports/scores of French sports)

Thursday

- 1405 UK, BBCWS E./N.Africa stream: Focus on Football (how soccer is developing globally)[1st wk.]
1405 UK, BBCWS W/Cntrl Africa stream: Sports International (issues/people behind headlines)[exc. Sust wk.]
1405 UK, BBCWS W/Cntrl Africa stream: Focus on Football (how soccer is developing globally)[Sust wk.]

- 1405 UK, BBCWS E./N.Africa stream: Sports International (issues/people behind headlines)[exc. 1st wk.]
1430 China R. Int.: Voices from Other Lands (China thru eyes of visitors)
1430 R. France Int.: Sports (reports/scores of French sports)

Friday

- 1430 China R. Int.: Life in China (magazine of everyday life)
1445 UK, BBCWS E./S.Africa stream: Football Extra (weekly global soccer report)
1452 R. France Int.: Sports (reports/scores of French sports)

Saturday

- 1405 R. Australia: New Dimensions (innovative ideas/thinkers)
1405 UK, BBCWS E.As/Aus/Pac stream: Sportsworld (play-by-play and reports)[to 1700]
1405 UK, BBCWS Americas stream: Sportsworld ("")
1405 UK, BBCWS S. Asia stream: Sportsworld ("")
1405 UK, BBCWS E./S.Africa stream: Sportsworld ("")
1405 UK, BBCWS W/Cntrl Africa stream: Sportsworld ("")
1405 UK, BBCWS Mideast/CIS stream: Sportsworld ("")
1405 UK, BBCWS E./N.Africa stream: Sportsworld ("")
1410 China R. Int.: Global Review (weekly comment/analyses)
1420 China R. Int.: Listeners' Garden (letters/interactive features)
1433 USA, VOA News Now: On the Line (US foreign policy discussed)



FREQUENCIES

| | | | | | | | | | | | | | | | | |
|------|------|---------|----------------------------------|---------|---------|----------|---------|--|------|------|---------|--------------------------------|---------|---------|---------|---------|
| 1500 | 1505 | occnsal | New Zealand, R New Zealand Int | 6100va | | | | | 1500 | 1600 | | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | 13840as |
| 1500 | 1530 | | Austria, R Austria International | 17865na | | | | | 1500 | 1600 | | Russia, Voice of Russia WS | 4940me | 4965me | 4975me | 7325me |
| 1500 | 1530 | | Ecuador, HCJB | 12005am | 15115am | 21455usb | | | | | | 9730eu | 11500as | 11985me | | |
| 1500 | 1530 | twfha | Mexico, R Mexico International | 5985am | 9705am | | | | 1500 | 1600 | | Seychelles, FEBA Radio | 11600as | | | |
| 1500 | 1530 | | Mongolia, Voice of | 12015as | 12085as | | | | 1500 | 1600 | | Sierra Leone, Sierra Leone BS | 5980do | | | |
| 1500 | 1530 | | S Africa, Channel Africa | 17770af | | | | | 1500 | 1600 | | Singapore R Corp of Singapore | 6150do | | | |
| 1500 | 1556 | | China China Radio International | 7160as | 7405na | 9785as | 13685af | | 1500 | 1600 | | Sri Lanka, Sri Lanka BC Corp | 4940do | 6005as | 6075as | 9770as |
| | | | | 15125af | | | | | | | | | 15425as | | | |
| 1500 | 1556 | | North Korea, R Pyongyang | 4405va | 6574na | 9335na | 11710na | | 1500 | 1600 | | Uganda, Radio | 4976do | 5026do | | |
| | | | | 13760na | | | | | 1500 | 1600 | | UK, BBC World Service | 5975as | 5990as | 6190af | 6195as |
| 1500 | 1559 | s | Canada, R Canada International | 13650na | 17800na | | | | | | | | 9515na | 9740as | 11860af | 11865na |
| 1500 | 1600 | | Anguilla, Caribbean Beacon | 11775am | | | | | | | | | 11940af | 12095eu | 15220na | 15310as |
| 1500 | 1600 | vl | Australia, ABC/Alice Springs | 2310do | | | | | | | | | 15400af | 15420af | 15485eu | 15575eu |
| 1500 | 1600 | vl | Australia, ABC/Katherine | 2485do | | | | | | | | | 17700as | 17830af | 17840am | 21470af |
| 1500 | 1600 | vl | Australia, ABC/Tennant Creek | 2325do | | | | | | | | | 21490af | 21660af | | |
| 1500 | 1600 | | Australia, Radio | 5995as | 6080va | 9475as | 9580va | | 1500 | 1600 | a | UK, Global Kitchen/Merlin | 9750eu | 11785eu | 15235eu | |
| | | | | 11650pa | 11660as | | | | 1500 | 1600 | a | UK, Virgin Radio/Merlin | 21455me | 21515af | | |
| 1500 | 1600 | vl | Botswana, Radio | 7255do | 9600do | 7255do | | | 1500 | 1600 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 1500 | 1600 | vl | Cameroon, RTV/Yaounde | 4850do | | | | | 1500 | 1600 | | USA, KALI Dallas TX | 13815va | | | |
| 1500 | 1600 | vl | Canada, CBC Northern Service | 9625do | | | | | 1500 | 1600 | | USA, KJES Vado NM | 11715na | | | |
| 1500 | 1600 | | Canada, CFRX Toronto ON | 6070do | | | | | 1500 | 1600 | | USA, KTVN Salt Lake City UT | 15590na | | | |
| 1500 | 1600 | | Canada, CFVP Calgary AB | 6030do | | | | | 1500 | 1600 | | USA, KWHR Naalehu HI | 9930as | 11565pa | | |
| 1500 | 1600 | | Canada, CKZN St John's NF | 6160do | | | | | 1500 | 1600 | | USA, VOA Special English | 6160as | 9760as | 9845as | 12040as |
| 1500 | 1600 | | Canada, CKZU Vancouver BC | 6160do | | | | | | | | | 15235as | | | |
| 1500 | 1600 | | Costa Rica, R for Peace Intl | 15049va | | | | | 1500 | 1600 | | USA, Voice of America | 7125as | 9645as | 9700me | 9780as |
| 1500 | 1600 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | | | | | 15205va | 15255va | | |
| | | | | 11870va | 13749af | | | | 1500 | 1600 | | USA, WEWN Birmingham AL | 11875na | 15745eu | | |
| 1500 | 1600 | as/vl | Eqt. Guinea, Radio East Africa | 15185af | | | | | 1500 | 1600 | | USA, WGTG McCaysville GA | 12172am | | | |
| 1500 | 1600 | | Germany, Deutsche Welle | 6140eu | | | | | 1500 | 1600 | mtwhf | USA, WGTG McCaysville GA | 9400va | | | |
| 1500 | 1600 | | Germany, Overcomer Ministries | 5850eu | | | | | 1500 | 1600 | | USA, WHRA Greenbush ME | 17650af | | | |
| 1500 | 1600 | | Germany, Voice of Hope | 15715as | 17550af | 21460me | | | 1500 | 1600 | | USA, WHRI Noblesville IN | 13760na | 15105sa | | |
| 1500 | 1600 | vl | Ghana, Ghana BC Corp | 4915do | 6130do | | | | 1500 | 1600 | | USA, WINB Red Lion PA | 13570am | | | |
| 1500 | 1600 | | Guam, Trans World Radio | 15330as | | | | | 1500 | 1600 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 1500 | 1600 | | Guyana, Voice of | 5949do | | | | | 1500 | 1600 | s | USA, WRMI Miami FL | 9955am | | | |
| 1500 | 1600 | | Japan, Radio | 9750as | 9860as | 11730as | | | 1500 | 1600 | | USA, WRNO New Orleans LA | 7395na | 15420al | | |
| 1500 | 1600 | | Jordan, Radio | 11690eu | | | | | 1500 | 1600 | | USA, WTJC Newport NC | 9370na | | | |
| 1500 | 1600 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | 1500 | 1600 | | USA, WWCR Nashville TN | 9475na | 12160na | 13845na | 15685na |
| 1500 | 1600 | vl | Lesotho, Radio | 4800do | | | | | 1500 | 1600 | | USA, WYFR Okeechobee FL | 11830na | 17750na | | |
| 1500 | 1600 | vl | Liberia, ELWA | 4760do | | | | | 1500 | 1600 | | Zambia, Christian Voice | 4965do | | | |
| 1500 | 1600 | vl | Liberia, R Liberia International | 6100do | | | | | 1500 | 1600 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 1500 | 1600 | | Malaysia, Radio | 7295do | | | | | 1500 | 1600 | vl | Zimbabwe, Zimbabwe BC Corp | 5975do | 6045do | | |
| 1500 | 1600 | | Malaysia, RTM Kota Kinabalu | 5980do | | | | | 1506 | 1600 | occnsal | New Zealand, R New Zealand Int | 6145va | | | |
| 1500 | 1600 | | Malaysia, RTM Sarawak | 7160do | | | | | 1515 | 1600 | vl | Malawi, Malawi BC Corp | 3380do | | | |
| 1500 | 1600 | | Myanmar, Radio | 5985do | | | | | 1530 | 1545 | | Afghanistan, Voice of Shari'ah | 7002do | 7073do | 7085as | |
| 1500 | 1600 | | Namibia, Namibian BC Corp | 7165af | 7215af | | | | 1530 | 1545 | | Bangladesh, Bangla Betar | 4882as | 15520as | | |
| 1500 | 1600 | | Netherlands, Radio | 9890as | 12065as | 15590as | | | 1530 | 1600 | vl | Botswana, Radio | 3356do | 4820do | 7255do | |
| 1500 | 1600 | | New Zealand, ZLXA | 3935do | | | | | 1530 | 1600 | | Ecuador, HCJB | 12005am | 15115am | | |
| 1500 | 1600 | vl | Nigeria, Radio/Enugu | 6025do | | | | | 1530 | 1600 | | Georgia, Georgian Radio | 6180me | | | |
| 1500 | 1600 | vl | Nigeria, Radio/Ibadan | 6050do | | | | | 1530 | 1600 | | Iran, VOIRI | 7115as | 9635as | 11775na | |
| 1500 | 1600 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do | | 1530 | 1600 | | S Africa, World Beacon | 6245af | | | |
| 1500 | 1600 | vl | Nigeria, Radio/Lagos | 4990do | 7285do | | | | 1545 | 1600 | sh | Bangladesh, Bangla Betar | 4882as | 15520as | | |
| 1500 | 1600 | vl | Nigeria, Voice of | 7265af | 15120af | | | | 1550 | 1600 | | Vatican City, Vatican Radio | 12065ou | 13765ou | 17730au | |

SELECTED PROGRAMS

Daily

| | |
|------|---|
| 1500 | China R. Int.: News |
| 1500 | R. Australia: News |
| 1500 | USA, VOA News Now: World News |
| 1500 | USA, VOA Special English: News |
| 1505 | USA, VOA Special English: All About English (educational) |
| 1510 | USA, VOA News Now: Regional News (news from the regions to which VOA is broadcasting) |
| 1514 | USA, VOA News Now: US News |
| 1518 | USA, VOA News Now: Sports (reports/scores) |
| 1518 | USA, VOA News Now: Sports (reports/scores) |
| 1522 | USA, VOA News Now: US feature (a report about the US) |
| 1530 | USA, VOA News Now: World News |
| 1530 | USA, VOA Special English: News (in special English) |

Sunday

1505 R. Australia: Encounter (religious experiences of Australia)
1510 China R. Int.: Report on Developing Countries (news/reports from)
1520 China R. Int.: In the Spotlight (cultural magazine)
1533 USA, VOA News Now: Women in Business [2nd Sun. only]
1533 USA, VOA News Now: Kaleidoscope (aspects of American culture
w/Susan Logue) [exc. 2nd Sun.]
1540 USA, VOA Special English: Words and Their Stories (etymology)
1545 USA, VOA Special English: 20th Century Americans (important
people of the century)
1555 R. Australia: On This Day (today in history)

Monday

1530 China R. Int.: People in the Know (magazine on modernizing China)
1530 R. Australia: Health Report
1540 USA, VOA Special English: Development Report
1545 USA, VOA Special English: This Is America (life in the US)

Monday-Friday

1505 R. Australia: Asia Pacific (regional current events/analysis)
1510 China R. Int.: Current Affairs (world/domestic correspondents' reports)
1536 USA, VOA News Now: Dateline (news background/analysis)
1545 USA, VOA News Now: Science, Medicine and the Environment
1549 USA, VOA News Now: Business and Economic News
1554 USA, VOA News Now: General feature report (a topical report)

Tuesday

1530 China R. Int.: Sports World (magazine of sports and China)
1530 China R. Int.: Sports World (magazine of sports and China)
1530 R. Australia: Law Report (the Australian legal profession/courts)
1540 USA, VOA Special English: Agriculture Today (brief farming report)
1545 USA, VOA Special English: Science in the News (latest developments in science)

Wednesday

1530 China R. Int.: China Horizons (business/economic development)
1530 R. Australia: Religion Report (Australian spiritual life)
1540 USA, VOA Special English: Science Report
1545 USA, VOA Special English: Explorations (reports on space/stars/human body)

Thursday

1530 China R. Int.: Voices from Other Lands (China thru eyes of visitors))
1530 R. Australia: Media Report (how the media operate)
1540 USA, VOA Special English: Science Report
1545 USA, VOA Special English: Making of a Nation (US history)

Friday

1505 UK, BBCWS Americas stream: Focus on Football (how soccer is
developing globally)[Sust wk.]

1505 UK, BBCWS Americas stream: Sports International (issues/people
behind headlines)[exc. Sust wk.]

1530 China R. Int.: Life in China (magazine of everyday life)

1530 R. Australia: The Sports Factor

1530 R. Australia: The Sports Factor

1540 USA, VOA Special English: Environment Report

1545 USA, VOA Special English: American Mosaic (student life/popu-
lar culture)

Saturday

1505 R. Australia: Melisma (musical revelations w/Robyn Johnston)
1505 UK, BBCWS Mideast/CIS stream: Sportsworld (play-by-play and reports)[cont'd from 1405]
1505 UK, BBCWS W/Cntrl Africa stream: Sportsworld ("")
1505 UK, BBCWS Americas stream: Sportsworld ("")
1505 UK, BBCWS S. Asia stream: Sportsworld ("")
1505 UK, BBCWS Eu/N.Africa stream: Sportsworld ("")
1505 UK, BBCWS E.As/Aus/Pac stream: Sportsworld("")
1505 UK, BBCWS E./S.Africa stream: Sportsworld ("")
1510 China R. Int.: Global Review (weekly comment/analyses)
1520 China R. Int.: Listeners' Garden (listener letters/interactive features)
1533 USA, VOA News Now: Our World (science/technology/agriculture w/Rob Sivak)
1540 USA, VOA Special English: In the News (explanation of a current event or personality)
1545 USA, VOA Special English: American Stories (short stories by American authors)



SELECTED PROGRAMS

1605 R. Australia: Melisma [cont'd from 1505]
1605 UK, BBCWS Eu/N. Africa stream: Sportsworld (play-by-play and reports) [cont'd from 1405]
1605 UK, BBCWS Mideast/CIS stream: Sportsworld (*)
1605 UK, BBCWS S. Asia stream: Sportsworld (*)
1605 UK, BBCWS W/Centrl Africa stream: Sportsworld (*)
1605 UK, BBCWS E./S. Africa stream: Sportsworld (*)
1605 UK, BBCWS Americas stream: Sportsworld (*)
1605 UK, BBCWS E.As/Aus/Pac stream: Sportsworld (*)
1610 China R. Int.: Global Review (weekly comment/analyses)
1620 China R. Int.: Listeners' Garden (letters/interactive features)
1633 USA, VOA News Now: Press Conference USA (w/America/foreign correspondents)



FREQUENCIES

| | | | | | | | | | | | | | | | |
|------|------|---------|----------------------------------|---------|---------|---------|---------|--|------|------|-------|------------------------------------|----------|---------|-----------------|
| 1700 | 1727 | | Czech Rep, Radio Prague Intl | 5930eu | 21745af | | | | 1800 | 1827 | | Vietnam, Voice of | 7440eu | 9730eu | 13740eu |
| 1700 | 1727 | | Vietnam, Voice of | 12070eu | | | | | 1800 | 1830 | | Egypt, Radio Cairo | 15255af | | |
| 1700 | 1730 | | Azerbaijan, Voice of | 6110eu | | | | | 1800 | 1830 | | Netherlands, Radio | 6020af | 7120af | 11655af |
| 1700 | 1730 | | France, R France International | 15210af | 17605af | | | | 1800 | 1830 | | S Africa, Adventist World Radio | 5960af | 6100af | |
| 1700 | 1730 | | Georgia, Georgian Radio | 11910eu | | | | | 1800 | 1830 | | S Africa, Channel Africa | 17870af | | |
| 1700 | 1730 | | S Africa, Channel Africa | 17860af | | | | | 1800 | 1830 | | UK, BBC World Service | 3255af | 5975as | 6190af 9410eu |
| 1700 | 1730 | | Swaziland, Trans World Radio | 9500af | | | | | | | | | 9510as | 9740pa | 12095eu 15400af |
| 1700 | 1730 | mtwhf | UK, Merlin Network One | 12065as | | | | | | | | | 15420af | 15575as | 17830af |
| 1700 | 1755 | | Poland, Radio Polonia | 6000eu | 7285eu | | | | 1800 | 1830 | mtwhf | UK, RTE Radio | | | |
| 1700 | 1756 | | China China Radio International | 5220af | 9570af | 9670af | 9695af | | 1800 | 1850 | | New Zealand, R New Zealand Int | 6145va | | |
| | | | | 11910af | 13700af | | | | 1800 | 1900 | | Anguilla, Caribbean Beacon | 11775am | | |
| 1700 | 1756 | | Romania, R Romania International | 15250eu | 15390eu | 17735eu | 17805eu | | 1800 | 1900 | mtwhf | Argentina, RAE | 15345eu | | |
| 1700 | 1800 | | Anguilla, Caribbean Beacon | 11775am | | | | | 1800 | 1900 | vl | Australia, ABC/Alice Springs | 2310do | | |
| 1700 | 1800 | vl | Australia, ABC/Alice Springs | 2310do | | | | | 1800 | 1900 | vl | Australia, ABC/Katherine | 2485do | | |
| 1700 | 1800 | vl | Australia, ABC/Katherine | 2485do | | | | | 1800 | 1900 | vl | Australia, ABC/Tennant Creek | 2325do | | |
| 1700 | 1800 | vl | Australia, ABC/Tennant Creek | 2325do | | | | | 1800 | 1900 | | Australia, Radio | 6080pa | 7240pa | 9475as 9580va |
| | | | | 5995as | 6080va | 9475as | 9580va | | | | | 9815pa | 11880va | | |
| 1700 | 1800 | vl | Botswana, Radio | 9815pa | 11880va | | | | 1800 | 1900 | | Bangladesh, Bangla Betar | 7184eu | 7462eu | 9558eu 15520eu |
| 1700 | 1800 | vl | Cameroon, RTV/Yaounde | 3356do | 4820do | 7255do | | | 1800 | 1900 | vl | Botswana, Radio | 3356do | 4820do | |
| 1700 | 1800 | vl | Canada, CBC Northern Service | 4850do | | | | | 1800 | 1900 | vl | Cameroon, RTV/Yaounde | 4850do | | |
| 1700 | 1800 | | Canada, CFRX Toronto ON | 9625do | | | | | 1800 | 1900 | | Canada, CFRX Toronto ON | 6070do | | |
| 1700 | 1800 | | Canada, CFRX Toronto ON | 6070do | | | | | 1800 | 1900 | | Canada, CFVP Calgary AB | 6030do | | |
| 1700 | 1800 | | Canada, CFVP Calgary AB | 6030do | | | | | 1800 | 1900 | | Canada, CKZN St John's NF | 6160do | | |
| 1700 | 1800 | | Canada, CKZN St John's NF | 6160do | | | | | 1800 | 1900 | | Canada, CKZU Vancouver BC | 6160do | | |
| 1700 | 1800 | | Canada, CKZU Vancouver BC | 6160do | | | | | 1800 | 1900 | | Costa Rica, R for Peace Intl | 15049va | | |
| 1700 | 1800 | | Costa Rica, R for Peace Intl | 15049va | | | | | 1800 | 1900 | | Costa Rica, University Network | 5030am | 6150va | 7375na 9725na |
| 1700 | 1800 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | | | | 11870va | 13749af | | |
| | | | | 11870va | 13749af | | | | 1800 | 1900 | mtwhf | Eqt Guinea, Radio Africa | 15185af | | |
| 1700 | 1800 | | Egypt, Radio Cairo | 15255af | | | | | 1800 | 1900 | | Germany, Deutsche Welle | 6140eu | | |
| 1700 | 1800 | mtwhf | Eqt Guinea, Radio Africa | 15185af | | | | | 1800 | 1900 | vl | Germany, Voice of Hope | 13810va | | |
| 1700 | 1800 | | Germany, Deutsche Welle | 6140eu | | | | | 1800 | 1900 | | Ghana, Ghana BC Corp | 3366do | 4915do | |
| 1700 | 1800 | a | Germany, Good News World R | 11795me | | | | | 1800 | 1900 | | Guyana, Voice of | 5949do | | |
| 1700 | 1800 | | Germany, Voice of Hope | 13810va | | | | | 1800 | 1900 | | India, All India Radio | 7410eu | 9950eu | 11620eu 11935af |
| 1700 | 1800 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | | | | | | | 13750af | 15200af | |
| 1700 | 1800 | | Guyana, Voice of | 5949do | | | | | 1800 | 1900 | vl | Italy, IRRS | 3980va | 4915do | 4935do |
| 1700 | 1800 | vl | Italy, IRRS | 3980va | 3985 | | | | 1800 | 1900 | | Kenya, Kenya BC Corp | 4885do | | |
| 1700 | 1800 | | Japan, Radio | 9505na | 12000eu | 15355af | | | 1800 | 1900 | | Kuwait, Radio | 11990va | 15230as | |
| 1700 | 1800 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | 1800 | 1900 | vl | Lesotho, Radio | 4800do | | |
| 1700 | 1800 | vl | Lesotho, Radio | 4800do | | | | | 1800 | 1900 | vl | Liberia, ELWA | 4760do | | |
| 1700 | 1800 | vl | Liberia, ELWA | 4760do | | | | | 1800 | 1900 | vl | Liberia, R Liberia International | 5100do | | |
| 1700 | 1800 | vl | Liberia, R Liberia International | 6100do | | | | | 1800 | 1900 | vl | Malawi, Malawi BC Corp | 3380do | | |
| 1700 | 1800 | vl | Malawi, Malawi BC Corp | 3380do | | | | | 1800 | 1900 | | Malaysia, Radio | 7295do | | |
| 1700 | 1800 | | Malaysia, Radio | 7295do | | | | | 1800 | 1900 | | Namibia, Namibian BC Corp | 3270af | 3289af | |
| 1700 | 1800 | | Namibia, Namibian BC Corp | 3270af | 3289af | | | | 1800 | 1900 | | New Zealand, ZLXA | 3935do | | |
| 1700 | 1800 | mtwh | New Zealand, R New Zealand Int | 6145va | | | | | 1800 | 1900 | vl | Nigeria, Radio/Enugu | 6025do | | |
| 1700 | 1800 | | New Zealand, ZLXA | 3935do | | | | | 1800 | 1900 | vl | Nigeria, Radio/Ibadan | 6050do | | |
| 1700 | 1800 | vl | Nigeria, Radio/Enugu | 6025do | | | | | 1800 | 1900 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do 9570do |
| 1700 | 1800 | vl | Nigeria, Radio/Ibadan | 6050do | | | | | 1800 | 1900 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | |
| 1700 | 1800 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do | | 1800 | 1900 | | Palau, KHBN/Voice of Hope | 9965as | | |
| 1700 | 1800 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | | | 1800 | 1900 | | Philippines, Radio Filipinas | 11720me | 15190me | 17720me |
| 1700 | 1800 | sm wh a | Palau, KHBN/Voice of Hope | 9955as | 9965as | | | | 1800 | 1900 | | Russia, Voice of Russia WS | 7300eu | 9480eu | 9720eu 9775eu |
| 1700 | 1800 | | Russia, Voice of Russia WS | 9820eu | | | | | 1800 | 1900 | | | 9820eu | 9890eu | 11510af 11675eu |
| 1700 | 1800 | | Russia, Voice of Russia WS | 9480eu | 9775eu | 9890eu | 11510af | | | | | 11695af | 12015af | | |
| | | | | 11675eu | 12015af | 12055me | | | 1800 | 1900 | m | S Africa, Amateur Radio League | 3215af | | |
| 1700 | 1800 | | S Africa, World Beacon | 6245af | 15445eu | | | | 1800 | 1900 | | S Africa, World Beacon | 3230af | 5925af | 15585eu |
| 1700 | 1800 | | Sierra Leone, Sierra Leone BS | 5980do | | | | | 1800 | 1900 | irreg | Sierra Leone, Sierra Leone BS | 5980do | | |
| 1700 | 1800 | irreg | Sri Lanka, Sri Lanka BC Corp | 4940do | | | | | 1800 | 1900 | | Sri Lanka, Sri Lanka BC Corp | 4940do | | |
| 1700 | 1800 | vl | Sudan, Radio Omdurman | 7199do | 9200do | 9505do | | | 1800 | 1900 | | Swaziland, Trans World Radio | 3200af | | |
| 1700 | 1800 | | Uganda, Radio | 4976do | 5026do | | | | 1800 | 1900 | | Taiwan, R Taiwan International | 3955eu | | |
| 1700 | 1800 | | UK, BBC World Service | 3255af | 3915af | 5975as | 6005af | | 1800 | 1900 | | Uganda, Radio | 4976do | 5026do | |
| | | | | 6190af | 7160as | 9510as | 9630af | | 1800 | 1900 | a | UK, BBC World Service | 17840na | | |
| | | | | 9740as | 12095eu | 15400af | 15420af | | 1800 | 1900 | mtwhf | UK, Merlin Network One | 12065as | | |
| | | | | 15485eu | 15575me | 17830af | 17840na | | 1800 | 1900 | hf | UK, Merlin Network One | 6130af | | |
| 1700 | 1800 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | | | 1800 | 1900 | | UK, World Beacon | 9675af | | |
| 1700 | 1800 | | USA, KAIJ Dallas TX | 13815va | | | | | 1800 | 1900 | | USA, Armed Forces Network | 4278am | 6458am | 12689am |
| 1700 | 1800 | | USA, KTVN Salt Lake City UT | 15590na | | | | | 1800 | 1900 | | USA, KAIJ Dallas TX | 13815va | | |
| 1700 | 1800 | | USA, KWHR Naalehu HI | 9930as | | | | | 1800 | 1900 | | USA, KTVN Salt Lake City UT | 15590na | | |
| 1700 | 1800 | | USA, Voice of America | 6160as | 7125as | 7170as | 9645as | | 1800 | 1900 | | USA, KWHR Naalehu HI | 17510as | | |
| | | | | 9700me | 9760af | 15255va | 15410af | | 1800 | 1900 | | USA, Voice of America | 6035af | 7415af | 9760af 9770me |
| | | | | 15445af | 17895af | | | | | | | | 11975af | 15410af | 15580af 17895af |
| 1700 | 1800 | mtwhf | USA, Voice of America | 5990as | 6045as | 7215as | 9550as | | 1800 | 1900 | | USA, WEWN Birmingham AL | 11875na | 13615na | 15745eu |
| | | | | 9770as | | | | | 1800 | 1900 | mtwhf | USA, WGTG McCaysville GA | 12172am | | |
| 1700 | 1800 | | USA, WEWN Birmingham AL | 11875na | 13615na | 15745eu | | | 1800 | 1900 | | USA, WGTG McCaysville GA | 9400va | | |
| 1700 | 1800 | mtwhf | USA, WGTG McCaysville GA | 12172am | | | | | 1800 | 1900 | | USA, WHRA Greenbush ME | 17650af | | |
| 1700 | 1800 | | USA, WGTG McCaysville GA | 9400va | | | | | 1800 | 1900 | | USA, WHRI Noblesville IN | 9495sa | 13760na | |
| 1700 | 1800 | | USA, WHRA Greenbush ME | 17650af | | | | | 1800 | 1900 | | USA, WINB Red Lion PA | 13570eu | | |
| 1700 | 1800 | | USA, WHRI Noblesville IN | 9495sa | 13760na | | | | 1800 | 1900 | mtwhf | USA, WJCR Upton KY | 7490va | 13595as | |
| 1700 | 1800 | | USA, WINB Red Lion PA | 13570eu | | | | | 1800 | 1900 | | USA, WMLK Bethel PA | 9465eu | | |
| 1700 | 1800 | mtwhf | USA, WJCR Upton KY | 7490va | 13595as | | | | 1800 | 1900 | | USA, WRNO New Orleans LA | 7395na | 15420al | |
| 1700 | 1800 | | USA, WMLK Bethel PA | 9465eu | | | | | 1800 | 1900 | | USA, WSHB Cypress Crk SC | 15665eu | 18910af | |
| 1700 | 1800 | | USA, WRNO New Orleans LA | 7395na | 15420al | | | | 1800 | 1900 | | USA, WTJC Newport NC | 9370na | | |
| 1700 | 1800 | | USA, WSHB Cypress Crk SC | 18910af | | | | | 1800 | 1900 | | USA, WWCR Nashville TN | 9475na | 12160na | 13845na 15685na |
| 1700 | 1800 | | USA, WTJC Newport NC | 9370na | | | | | 1800 | 1900 | | USA, WYFR Okeechobee FL | 17555eu | | |
| 1700 | 1800 | | USA, WWCR Nashville TN | 9475na | 12160na | 13845na | 15685na | | 1800 | 1900 | | Yemen, Rep of Yemen Radio | 9779me | | |
| 1700 | 1800 | | USA, WYFR Okeechobee FL | 18980eu | 21455eu | | | | 1800 | 1900 | | Zambia, Christian Voice | 4965do | | |
| 1700 | 1800 | | Zambia, Christian Voice | 4965do | | | | | 1800 | 1900 | vl | Zambia, National BC Corp | 6165do | 6265do | |
| 1700 | 1800 | vl | Zambia, National BC Corp | 6165do | 6265do | | | | 1800 | 1900 | vl | Zimbabwe, Zimbabwe BC Corp | 4828do | 6045do | |
| 1700 | 1800 | vl | Zimbabwe, Zimbabwe BC Corp | 4828do | 6045do | | | | 1805 | 1830 | | Croatia, Croatian Radio | 6165eu | 13830eu | |
| 1730 | 1745 | mtwhf | Libya, Voice of Africa | 11815af | 15415af | 17725va | | | 1810 | 1900 | s | Greece, Voice of | 9420eu | 15630af | 17705na |
| 1730 | 1745 | | Swaziland, Trans World Radio | 3200af | | | | | 1830 | 1840 | | Greece, Voice of | 7475eu | 9420eu | 15630af 17705na |
| 1730 | 1756 | | Belgium, Radio Vlaanderen Intl | 5910eu | 9925eu | 13710eu | 17590af | | 1830 | 1845 | | Albania, R Tirana International | 7180eu | | |
| 1730 | 1800 | as | Georgia, Georgian Radio | 6080eu | | | | | 1830 | 1900 | | Ascension Is, RTE Radio | 21630af | | |
| 1730 | 1800 | | Guam, Adventist World Radio | 11560va | 11965va | 11965as | | | 1830 | 1900 | | Austria, R Austria International | 13730af | | |
| 1730 | 1800 | | Netherlands, Radio | 6020af | 7120af | 11655af | | | 1830 | 1900 | | Canada, RTE Radio | 13725va | | |
| 1730 | 1800 | | Philippines, Radio Filipinas | 11720me | 15190me | 17720me | | | 1830 | 1900 | | Georgia, Georgian Radio | 11760eu | | |
| 1730 | 1800 | | S Africa, Adventist World Radio | 12130va | | | | | 1830 | 1900 | | Netherlands, Radio | 6020af | 7120af | 9895af 11655af |
| 1730 | 1800 | mtwhfa | Sweden, Radio | 6065eu | | | | | | | | | 13700af | 17605af | 21590af |
| 1730 | 1800 | s | Sweden, Radio | 13800eu | | | | | 1830 | 1900 | | Serbia, Radio Yugoslavia | 6100eu | | |
| 1730 | 1800 | mtwhf | UK, BBC World Service | 9750as | 12045as | 15310as | | | 1830 | 1900 | | Slovakia, R Slovakia International | 5920eu | 6055eu | 7345eu |
| 1730 | 1800 | | UK, Merlin Network One | 12065as | 15560as | | | | 1830 | 1900 | | Turkey, Voice of | 9785as</ | | |



FREQUENCIES

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|------|------|------------------------------------|---------|---------|---------|---------|--|------|------|------------------------------------|---------|---------|---------|---------|
| 1900 | 1915 | Congo, RTV Congolaise | 5985do | | | | | 2000 | 2010 | Vatican City, Vatican Radio | 4005eu | 5880eu | 7250eu | 9645eu |
| 1900 | 1927 | Vietnam, Voice of | 9730eu | 13740eu | | | | 2000 | 2015 | mtwhfa | 9660af | 11625af | 13765af | |
| 1900 | 1930 | Hungary, Radio Budapest | 6025eu | 7130eu | | | | 2000 | 2015 | | 4810eu | 9965eu | | |
| 1900 | 1930 | Israel, Kol Israel | 11605af | 15640va | 15650af | 17535va | | 2000 | 2025 | Armenia, Voice of | 3200af | | | |
| 1900 | 1930 | Philippines, Radio Filipinas | 11720me | 15190me | 17720pa | | | 2000 | 2025 | Swaziland, Trans World Radio | 6035eu | 7185eu | 7265eu | 9525eu |
| 1900 | 1930 | Switzerland, Swiss R International | 6110eu | | | | | 2000 | 2027 | Poland, Radio Polonia | 5930eu | 11600as | | |
| 1900 | 1930 | Turkey, Voice of | 9785as | 11765as | | | | 2000 | 2030 | Czech Rep, Radio Prague Intl | 9022eu | 9575eu | 11670eu | |
| 1900 | 1930 | USA, Voice of America | 7260me | 9525pa | 9760af | 9770af | | 2000 | 2030 | Iran, VOIRI | 12015eu | 12085eu | | |
| 1900 | 1930 | | 11870pa | 15180pa | | | | 2000 | 2030 | Mongolia, Voice of | 6020af | 7120af | 11655af | 13700af |
| 1900 | 1930 | as | 6035af | 7375af | 7415af | 11975af | | 2000 | 2030 | Netherlands, Radio | 17605af | 21590af | | |
| 1900 | 1930 | | 15410af | 15445af | 15580af | | | 2000 | 2030 | Switzerland, Swiss R International | 13710af | 13770af | 15220af | 17580af |
| 1900 | 1930 | a | 4950af | | | | | 2000 | 2030 | USA, Voice of America | 4950af | 6035af | 6095me | 7375af |
| 1900 | 1945 | Germany, Deutsche Welle | 11765af | 11810af | 13720af | 15390af | | | | | 7415af | 9760af | 9770af | 11855af |
| 1900 | 1945 | | 17810af | | | | | | | | 11975af | 15410af | 15445af | 15580af |
| 1900 | 1945 | India, All India Radio | 7410eu | 9950eu | 11620eu | 11935af | | 2000 | 2045 | | 17725af | 17745af | | |
| 1900 | 1950 | New Zealand, R New Zealand Int | 13750af | 15200af | 17670af | | | 2000 | 2056 | Germany, Deutsche Welle | 7130eu | 7390eu | 9440af | 11735af |
| 1900 | 1956 | China China Radio International | 11725va | | | | | 2000 | 2056 | China China Radio International | 7390eu | 9440af | 11735af | 11790eu |
| 1900 | 2000 | Anguilla, Caribbean Beacon | 9440af | 11750af | 13790af | | | 2000 | 2100 | | 13640af | 15110eu | 17790eu | |
| 1900 | 2000 | Australia, ABC/Katherine | 11775am | | | | | 2000 | 2100 | Algeria, R Algiers International | 11715eu | 15160eu | | |
| 1900 | 2000 | Australia, ABC/Tennant Creek | 2485do | | | | | 2000 | 2100 | Angola, R Nacional de Angola | 3374va | 7245va | | |
| 1900 | 2000 | Australia, Radio | 2325do | | | | | 2000 | 2100 | Anguilla, Caribbean Beacon | 11775am | | | |
| 1900 | 2000 | | 6080pa | 7240pa | 9500as | 9580va | | 2000 | 2100 | Australia, ABC/Alice Springs | 2100 | 3100do | | |
| 1900 | 2000 | | 9815pa | 11880va | | | | 2000 | 2100 | Australia, ABC/Katherine | 2485do | | | |
| 1900 | 2000 | vi | 3356do | 4820do | | | | 2000 | 2100 | Australia, ABC/Tennant Creek | 2325do | | | |
| 1900 | 2000 | | 9400na | 11700eu | | | | 2000 | 2100 | Australia, Radio | 9500as | 9580va | 9815pa | 11880va |
| 1900 | 2000 | vi | 4850do | | | | | 2000 | 2100 | | 12080va | | | |
| 1900 | 2000 | Cameroon, RTV/Yaounde | 6070do | | | | | 2000 | 2100 | Botswana, Radio | 3356do | 4820do | | |
| 1900 | 2000 | Canada, CFRX Toronto ON | 6030do | | | | | 2000 | 2100 | Cameroon, RTV/Yaounde | 4850do | | | |
| 1900 | 2000 | Canada, CFVP Calgary AB | 6160do | | | | | 2000 | 2100 | Canada, CFRX Toronto ON | 6070do | | | |
| 1900 | 2000 | Canada, CKZN St John's NF | 6160do | | | | | 2000 | 2100 | Canada, CFVP Calgary AB | 6030do | | | |
| 1900 | 2000 | Canada, CKZU Vancouver BC | 6160do | | | | | 2000 | 2100 | Canada, CKZN St John's NF | 6160do | | | |
| 1900 | 2000 | Costa Rica, R for Peace Intl | 15049va | | | | | 2000 | 2100 | Canada, CKZU Vancouver BC | 6160do | | | |
| 1900 | 2000 | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | | 2000 | 2100 | Canada, R Canada International | 5925va | 11690va | 13650va | 13670va |
| 1900 | 2000 | | 11870va | 13749af | | | | 2000 | 2100 | | 15325va | 15470va | 17820va | 17870va |
| 1900 | 2000 | Ecuador, HCJB | 17660eu | | | | | 2000 | 2100 | | 15049va | | | |
| 1900 | 2000 | mtwhf | 15185af | | | | | 2000 | 2100 | Costa Rica, R for Peace Intl | 5030am | 6150va | 7375na | 9725na |
| 1900 | 2000 | | 13810va | | | | | 2000 | 2100 | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na |
| 1900 | 2000 | vi | 3366do | 4915do | | | | 2000 | 2100 | | 11870va | 13749af | | |
| 1900 | 2000 | Ghana, Ghana BC Corp | 3980va | 3985 | | | | 2000 | 2100 | Ecuador, HCJB | 17660eu | | | |
| 1900 | 2000 | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | | | 2000 | 2100 | Egt Guinea, Radio Africa | 15185af | | | |
| 1900 | 2000 | Kuwait, Radio | 11990va | 15230as | | | | 2000 | 2100 | Germany, Voice of Hope | 13810va | | | |
| 1900 | 2000 | vi | 4800do | | | | | 2000 | 2100 | Ghana, Ghana BC Corp | 3366do | 4915do | | |
| 1900 | 2000 | vi | 4760do | | | | | 2000 | 2100 | Indonesia, Voice of | 9525va | 11785va | 15149va | |
| 1900 | 2000 | vi | 5100do | | | | | 2000 | 2100 | Iraq, Radio Iraq International | 9684va | 11787va | | |
| 1900 | 2000 | vi | 3380do | | | | | 2000 | 2100 | Italy, IRRS | 3980va | 3985 | | |
| 1900 | 2000 | Malawi, Malawi BC Corp | 7295do | | | | | 2000 | 2100 | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | |
| 1900 | 2000 | Malaysia, Radio | 12060eu | | | | | 2000 | 2100 | Kuwait, Radio | 4800do | 15230as | | |
| 1900 | 2000 | mtwhfa | 3270af | 3289af | 11655af | 13700af | | 2000 | 2100 | Lesotho, Radio | 4760do | | | |
| 1900 | 2000 | | 6020af | 7120af | | | | 2000 | 2100 | Liberia, ELWA | 5100do | | | |
| 1900 | 2000 | | 17605af | 21590af | | | | 2000 | 2100 | Liberia, R Liberia International | 5100do | | | |
| 1900 | 2000 | | 3935do | | | | | 2000 | 2100 | Malawi, Malawi BC Corp | 3380do | | | |
| 1900 | 2000 | vi | 6025do | | | | | 2000 | 2100 | Malaysia, Radio | 7295do | | | |
| 1900 | 2000 | Nigeria, Radio/Ibadan | 6050do | | | | | 2000 | 2100 | Namibia, Namibian BC Corp | 3270af | 3289af | | |
| 1900 | 2000 | vi | 4770do | 6090do | 7275do | 9570do | | 2000 | 2100 | New Zealand, R New Zealand Int | 17675va | | | |
| 1900 | 2000 | Nigeria, Radio/Lagos | 3326do | 4990do | | | | 2000 | 2100 | New Zealand, ZLX | 3935do | 7290do | | |
| 1900 | 2000 | vi | 4770do | | | | | 2000 | 2100 | Nigeria, Radio/Enugu | 6025do | | | |
| 1900 | 2000 | Nigeria, Voice of | 7265af | 15120af | | | | 2000 | 2100 | Nigeria, Radio/Ibadan | 6050do | | | |
| 1900 | 2000 | North Korea, R Pyongyang | 4405va | 6574na | 9335na | 11710na | | 2000 | 2100 | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| | | | 13760na | | | | | 2000 | 2100 | Nigeria, Radio/Lagos | 3326do | 4990do | | |
| 1900 | 2000 | Russia, Voice of Russia WS | 9480eu | 9775eu | 9820eu | 9890eu | | 2000 | 2100 | Nigeria, Voice of | 7265af | 15120af | | |
| | | | 11675eu | 12070eu | | | | 2000 | 2100 | Papua New Guinea, NBC | 4890do | | | |
| 1900 | 2000 | | 3230af | 5925af | 7360eu | 15585eu | | 2000 | 2100 | Russia, Voice of Russia WS | 9775eu | 9775eu | 9820eu | 9890eu |
| 1900 | 2000 | S Africa, World Beacon | 3316do | | | | | 2000 | 2100 | | 11675eu | 15485eu | | |
| 1900 | 2000 | Sierra Leone, Sierra Leone BS | 5020do | | | | | 2000 | 2100 | S Africa, World Beacon | 3230af | 5925af | 7360eu | 15585eu |
| 1900 | 2000 | vi | 5020do | | | | | 2000 | 2100 | | 15585 | | | |
| 1900 | 2000 | South Korea, R Korea Intl | 5975am | 7275eu | | | | 2000 | 2100 | Sierra Leone, Sierra Leone BS | 3316do | | | |
| 1900 | 2000 | irreg | 4940do | | | | | 2000 | 2100 | Solomon Islands, SIBC | 5020do | | | |
| 1900 | 2000 | a | 6010eu | | | | | 2000 | 2100 | Spain, R Exterior Espana | 9595af | 15285af | | |
| 1900 | 2000 | | 3200af | | | | | 2000 | 2100 | Sri Lanka, Sri Lanka BC Corp | 4940do | | | |
| 1900 | 2000 | Thailand, Radio | 7195eu | 9655eu | 11905eu | | | 2000 | 2100 | Syria, Radio Damascus | 12085eu | 13610eu | | |
| 1900 | 2000 | Uganda, Radio | 4976do | 5026do | | | | 2000 | 2100 | Uganda, Radio | 4976do | 5026do | | |
| 1900 | 2000 | UK, BBC World Service | 3255af | 6005af | 6190af | 6190eu | | 2000 | 2100 | UK, BBC World Service | 3255af | 6005af | 6190af | |
| | | | 9410eu | 9630af | 9740pa | 12095eu | | 2000 | 2100 | | 3255af | 9410eu | 9630af | 9740pa |
| | | | 15400af | 15575me | 17830af | | | 2000 | 2100 | | 11835eu | 12095eu | 15400af | 17830af |
| 1900 | 2000 | h | 17840na | | | | | 2000 | 2100 | UK, World Beacon | 9675af | | | |
| 1900 | 2000 | UK, Merlin Network One | 6130af | | | | | 2000 | 2100 | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 1900 | 2000 | UK, World Beacon | 9675af | | | | | 2000 | 2100 | USA, KALJ Dallas TX | 13815va | | | |
| 1900 | 2000 | USA, Armed Forces Network | 4278am | 6458am | 12689am | | | 2000 | 2100 | USA, KJES Vado NM | 15385 | au | | |
| 1900 | 2000 | USA, KALJ Dallas TX | 13815va | | | | | 2000 | 2100 | USA, KTNB Salt Lake City UT | 15590na | | | |
| 1900 | 2000 | USA, KJES Vado NM | 15385na | | | | | 2000 | 2100 | USA, KWHR Naalehu HI | 17510as | | | |
| 1900 | 2000 | USA, KTNB Salt Lake City UT | 15590na | | | | | 2000 | 2100 | USA, WBCQ Monticello ME | 7415na | | | |
| 1900 | 2000 | USA, KWHR Naalehu HI | 17510as | | | | | 2000 | 2100 | USA, WEWN Birmingham AL | 11875na | 13615na | 15745eu | |
| 1900 | 2000 | USA, VOA Special English | 6160me | 9680me | 13690me | | | 2000 | 2100 | USA, WGTG McCaysville GA | 12172am | | | |
| 1900 | 2000 | mtwhf | 9565eu | 9840as | 11780me | 11970as | | 2000 | 2100 | USA, WGTG McCaysville GA | 12172am | | | |
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FREQUENCIES

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|------|------|-------|----------------------------------|---------|---------|---------|---------|
| 2100 | 2115 | mtwhf | UK, BBC World Service | 11675ca | | | |
| 2100 | 2130 | vl | Australia, ABC/Alice Springs | 2310do | | | |
| 2100 | 2130 | vl | Australia, ABC/Katherine | 2485do | | | |
| 2100 | 2130 | vl | Australia, ABC/Tennant Creek | 2325do | | | |
| 2100 | 2130 | | Australia, Radio | 7240pa | 9500as | 9580va | 9660pa |
| | | | | 11880va | 12080va | 17715pa | 21740va |
| 2100 | 2130 | | China China Radio International | 5965va | 7150va | 7590va | 9535va |
| | | | | 11735af | 11790eu | 13640af | 15110eu |
| | | | | 15125eu | 17790eu | | |
| | | | | 13660eu | 13750eu | | |
| 2100 | 2130 | | Cuba, Radio Havana | 6025eu | | | |
| 2100 | 2130 | | Hungary, Radio Budapest | 4885do | 4915do | 4935do | |
| 2100 | 2130 | | Kenya, Kenya BC Corp | 6100eu | | | |
| 2100 | 2130 | | Serbia, Radio Yugoslavia | 3970eu | 6480eu | 15575eu | |
| 2100 | 2130 | | South Korea, R Korea Intl | 9525as | | | |
| 2100 | 2130 | | Turkey, Voice of | 6035af | 6040me | 6095me | 7375af |
| 2100 | 2130 | | USA, Voice of America | 7415af | 9535af | 9705pa | 9760eu |
| | | | | 11870pa | 11875af | 15185as | 15410af |
| | | | | 15445af | 15580af | 17725af | 17735as |
| | | | | 17820as | | | |
| 2100 | 2145 | | Germany, Deutsche Welle | 9670as | 9765as | 9875af | 11865af |
| | | | | 11915as | 15135va | | |
| 2100 | 2145 | | USA, WYFR Okeechobee FL | 15120af | 17555eu | 17845af | |
| 2100 | 2156 | | North Korea, R Pyongyang | 6574va | 9335va | | |
| 2100 | 2156 | | Romania, R Romania International | 11740eu | 11940eu | 15105eu | 15180eu |
| 2100 | 2200 | | Anguilla, Caribbean Beacon | 11775am | | | |
| 2100 | 2200 | vl | Botswana, Radio | 3356do | 4820do | | |
| 2100 | 2200 | | Bulgaria, Radio | 9400eu | 11700eu | | |
| 2100 | 2200 | vl | Cameroon, RTV/Yaounde | 4850do | | | |
| 2100 | 2200 | vl | Canada, CBC Northern Service | 9625do | | | |
| 2100 | 2200 | | Canada, CFRX Toronto ON | 6070do | | | |
| 2100 | 2200 | | Canada, CFVP Calgary AB | 6030do | | | |
| 2100 | 2200 | | Canada, CKZN St John's NF | 6160do | | | |
| 2100 | 2200 | | Canada, CKZU Vancouver BC | 6160do | | | |
| 2100 | 2200 | | Canada, R Canada International | 7235va | 11690va | 13650va | 13670va |
| | | | | 15325va | 17820va | 17870va | |
| | | | | 15049va | | | |
| 2100 | 2200 | | Costa Rica, R for Peace Intl | 5030am | 6150va | 7375na | 9725na |
| 2100 | 2200 | | Costa Rica, University Network | 11870va | 13749af | | |
| | | | | 17660eu | | | |
| 2100 | 2200 | | Ecuador, HCJB | 15375af | | | |
| 2100 | 2200 | mtwhf | Egypt, Radio Cairo | 15185af | | | |
| 2100 | 2200 | | Egt Guinea, Radio Africa | 3366do | 4915do | | |
| 2100 | 2200 | vl | Ghana, Ghana BC Corp | 7150va | 7410eu | 9650eu | 9910au |
| 2100 | 2200 | | India, All India Radio | 9950eu | 11620au | 11715me | |
| | | | | 3980as | | | |
| 2100 | 2200 | vl | Italy, IRRS | 6035pa | 9725eu | 11850pa | 11855af |
| 2100 | 2200 | | Japan, Radio | 17825na | 21670pa | | |
| | | | | 4800do | | | |
| 2100 | 2200 | vl | Lesotho, Radio | 4760do | | | |
| 2100 | 2200 | vl | Liberia, ELWA | 5100do | | | |
| 2100 | 2200 | vl | Liberia, R Liberia International | 3380do | | | |
| 2100 | 2200 | vl | Malawi, Malawi BC Corp | 7295do | | | |
| 2100 | 2200 | | Malaysia, Radio | 3270af | 3289af | | |
| 2100 | 2200 | | Namibia, Namibian BC Corp | 17675va | | | |
| 2100 | 2200 | | New Zealand, R New Zealand Int | 3935do | | | |
| 2100 | 2200 | vl | New Zealand, ZLXA | 6025do | | | |
| 2100 | 2200 | vl | Nigeria, Radio/Enugu | 6050do | | | |
| 2100 | 2200 | vl | Nigeria, Radio/Ibadan | 4770do | 6090do | 7275do | 9570do |
| 2100 | 2200 | vl | Nigeria, Radio/Kaduna | 3326do | 4990do | | |
| 2100 | 2200 | vl | Nigeria, Radio/Lagos | 9985as | | | |
| 2100 | 2200 | vl | Palau, KHBN/Voice of Hope | 4890do | | | |
| 2100 | 2200 | vl | Papua New Guinea, NBC | 3230af | 5925af | 7360eu | |
| 2100 | 2200 | | S Africa, World Beacon | 3316do | | | |
| 2100 | 2200 | vl | Sierra Leone, Sierra Leone BS | 5020do | 9545do | | |
| 2100 | 2200 | s | Solomon Islands, SIBC | 9595af | 9840eu | | |
| 2100 | 2200 | irreg | Spain, R Exterior Espana | 4940do | | | |
| 2100 | 2200 | vl | Sri Lanka, Sri Lanka BC Corp | 12085eu | 13610eu | | |
| 2100 | 2200 | | Syria, Radio Damascus | 3255af | 3915as | 5965as | 5975va |
| 2100 | 2200 | | UK, BBC World Service | 6005af | 6190af | 6195va | 9410eu |
| | | | | 9740pa | 11835af | 11945as | 12095sa |
| | | | | 15400af | | | |
| 2100 | 2200 | fa | UK, Global Kitchen/Merlin | 3955eu | 7325eu | | |
| 2100 | 2200 | | UK, World Beacon | 9675af | | | |
| 2100 | 2200 | | Ukraine, R Ukraine International | 5905eu | 6020eu | 9640eu | 11950eu |
| | | | | 15530eu | | | |
| 2100 | 2200 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | |
| 2100 | 2200 | | USA, KAU Dallas TX | 13815va | | | |
| 2100 | 2200 | | USA, KTN Salt Lake City UT | 15590na | | | |
| 2100 | 2200 | | USA, KWHR Naalehu HI | 17510as | | | |
| 2100 | 2200 | mtwhf | USA, WBCQ Monticello ME | 7415na | | | |
| 2100 | 2200 | | USA, WBCQ Monticello ME | 9330na | | | |
| 2100 | 2200 | | USA, WEWN Birmingham AL | 11875na | 13615na | 15745eu | |
| 2100 | 2200 | mtwhf | USA, WGTG McCaysville GA | 12172am | | | |
| 2100 | 2200 | | USA, WGTG McCaysville GA | 9400va | | | |
| 2100 | 2200 | | USA, WHRA Greenbush ME | 17650af | | | |
| 2100 | 2200 | | USA, WHRI Noblesville IN | 5745na | 9495sa | | |
| 2100 | 2200 | | USA, WINB Red Lion PA | 13570eu | | | |
| 2100 | 2200 | | USA, WJCR Upton KY | 7490va | 13595as | | |
| 2100 | 2200 | s | USA, WRMI Miami FL | 9955am | | | |
| 2100 | 2200 | a | USA, WRMI Miami FL | 7385na | | | |
| 2100 | 2200 | | USA, WRNO New Orleans LA | 7395na | 15420af | | |
| 2100 | 2200 | | USA, WSHB Cypress Crk SC | 15665eu | 18910af | | |
| 2100 | 2200 | | USA, WTJC Newport NC | 9370na | | | |
| 2100 | 2200 | | USA, WWCR Nashville TN | 9475na | 12160na | 13845na | 15685na |
| 2100 | 2200 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 2100 | 2200 | | Zambia, Christian Voice | 4965do | | | |
| 2100 | 2200 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 2100 | 2200 | mtwhf | Zimbabwe, Zimbabwe BC Corp | 4828do | 6045do | | |
| 2115 | 2130 | as | UK, BBC Caribbean Report | 5975ca | 11675ca | 15390ca | |
| 2115 | 2130 | | UK, BBC World Service | 5975ca | | | |
| 2115 | 2200 | | Egypt, Radio Cairo | 9990eu | | | |
| 2120 | 2200 | s | Greece, Voice of | 9425au | 15650au | | |
| 2130 | 2145 | tf | UK, BBC Colling Falklands | 11680as | | | |
| 2130 | 2156 | | China China Radio International | 15110eu | 17790eu | | |
| 2130 | 2157 | | Czech Rep, Radio Prague Intl | 11600as | 15545af | | |
| 2130 | 2200 | vl | Albania, R Tirana International | 7130eu | 9540eu | | |
| 2130 | 2200 | vl | Australia, ABC/Alice Springs | 4830do | | | |
| 2130 | 2200 | vl | Australia, ABC/Katherine | 5025do | | | |
| 2130 | 2200 | vl | Australia, ABC/Tennant Creek | 4910do | | | |
| 2130 | 2200 | | Australia, Radio | 7240pa | 9660pa | 11880va | 12080va |

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|------|------|--------|----------------------------------|---------|---------|---------|---------|
| 2130 | 2200 | | Australia, Radio | 17715pa | 21740va | 11880va | 12080va |
| | | | | 7240pa | 9660pa | | |
| | | | | 17715pa | 21740va | | |
| 2130 | 2200 | | Austria, R Austria International | 5945eu | 6155eu | 13730af | |
| 2130 | 2200 | | Guam, Adventist World Radio | 11980as | 15550as | | |
| 2130 | 2200 | | Hungary, Radio Budapest | 3975eu | | | |
| 2130 | 2200 | | Iran, VOIR | 11740as | 13745as | | |
| 2130 | 2200 | | South Korea, R Korea Intl | 15575eu | | | |
| 2130 | 2200 | | Sweden, Radio | 6085eu | 9435eu | 15255as | |
| 2130 | 2200 | | USA, Voice of America | 6040me | 6095me | 9335af | 9705as |
| | | | | 9760eu | 11870pa | 15185as | 17735as |
| | | | | 17820as | | | |
| 2130 | 2200 | smtwhf | USA, Voice of America | 6035af | 7375af | 7415af | 11975af |
| 2130 | 2200 | | Uzbekistan, Radio Tashkent | 15410af | 15445af | 15580af | 17725af |
| 2145 | 2200 | | USA, WYFR Okeechobee FL | 9540eu | 9545eu | | |
| | | | | 15120af | 17845af | | |

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|------|------|-----------|----------------------------------|---------|---------|---------|---------|
| 2200 | 2210 | vl | Malawi, Malawi BC Corp | 3380do | | | |
| 2200 | 2210 | vl | Zambia, National BC Corp | 6165do | 6265do | | |
| 2200 | 2220 | s | Greece, Voice of | 9425au | 15650au | | |
| 2200 | 2225 | | Iran, VOIR | 11740as | 13745as | | |
| 2200 | 2230 | | Italy, RAI International | 9675as | 11900as | 15240as | |
| 2200 | 2230 | | Canada, R Canada International | 5960am | 9755am | 13670am | 15305am |
| | | | | 17695am | 17835as | | |
| 2200 | 2230 | | India, All India Radio | 7150va | 7410eu | 9650eu | 9910au |
| | | | | 9950eu | 11620au | 11715me | |
| 2200 | 2230 | mexico, R | Mexico International | 5985am | | | |
| 2200 | 2230 | vlpapa | New Guinea, NBC | 4890do | | | |
| 2200 | 2230 | smtwhf | Serbia, Radio Yugoslavia | 7230au | | | |
| 2200 | 2230 | | USA, Voice of America | 7215as | 9705as | 9770as | 11760as |
| | | | | 15185as | 15290as | 15305as | 17735as |
| | | | | 17820as | | | |
| 2200 | 2230 | mtwhf | USA, Voice of America | 6035af | 7340af | 7375af | 7415af |
| | | | | 11975af | | | |
| 2200 | 2245 | | Egypt, Radio Cairo | 9990eu | | | |
| 2200 | 2245 | a | USA, WRMI Miami FL | 7385na | | | |
| 2200 | 2245 | | USA, WYFR Okeechobee FL | 11740na | 15120af | 17845af | |
| 2200 | 2256 | | China China Radio International | 7170eu | 9880eu | | |
| 2200 | 2300 | | Anguilla, Caribbean Beacon | 6090am | | | |
| 2200 | 2300 | vl | Australia, ABC/Alice Springs | 4835do | | | |
| 2200 | 2300 | vl | Australia, ABC/Katherine | 5025do | | | |
| 2200 | 2300 | vl | Australia, ABC/Tennant Creek | 4910do | | | |
| 2200 | 2300 | vl | Australia, Radio | 11715pa | 17795va | 21740va | |
| 2200 | 2300 | vl | Cameroon, RTV/Yaounde | 4850do | | | |
| 2200 | 2300 | | Canada, CBC Northern Service | 9625do | | | |
| 2200 | 2300 | | Canada, CFRX Toronto ON | 6070do | | | |
| 2200 | 2300 | | Canada, CFVP Calgary AB | 6030do | | | |
| 2200 | 2300 | | Canada, CKZN St John's NF | 6160do | | | |
| 2200 | 2300 | | Canada, CKZU Vancouver BC | 6160do | | | |
| 2200 | 2300 | | Costa Rica, R for Peace Intl | 15049va | | | |
| 2200 | 2300 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na |
| | | | | 11870va | 13749af | | |
| 2200 | 2300 | mtwhf | Egt Guinea, Radio Africa | 1185af | | | |
| 2200 | 2300 | | Germany, Overcomer Ministries | 7295eu | | | |
| 2200 | 2300 | vl | Ghana, Ghana BC Corp | 3366do | 4915do | | |
| 2200 | 2300 | | Kenya, Kenya BC Corp | 4885do | 4915do | 4935do | |
| 2200 | 2300 | vl | Liberia, R Liberia International | 5100do | | | |
| 2200 | 2300 | | Malaysia, Radio | 7295do | | | |
| 2200 | 2300 | | Namibia, Namibian BC Corp | 3270af | 3289af | | |
| 2200 | 2300 | | New Zealand, R New Zealand Int | 17675va | | | |
| 2200 | 2300 | | New Zealand, ZLXA | 3935do | | | |
| 2200 | 2300 | vl | Nigeria, Radio/Enugu | 6025do | | | |
| 2200 | 2300 | vl | Nigeria, Radio/Ibadan | 6050do | | | |
| 2200 | 2300 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| 2200 | 2300 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | |
| 2200 | 2300 | vl | Palau, KHBN/Voice of Hope | 9955as | 9965as | 9985as | |
| 2200 | 2300 | vl | Sierra Leone, Sierra Leone BS | 3316do | | | |
| 2200 | 2300 | vl | Solomon Islands, SIBC | 5020do | 9545do | | |
| 2200 | 2300 | irreg | Sri Lanka, Sri Lanka BC Corp | 4940do | | | |
| 2200 | 2300 | | Taiwan, R Taiwan International | 11565eu | 15600eu | | |
| 2200 | 2300 | | Turkey, Voice of | 7190eu | 13640va | | |
| 2200 | 2300 | | UK, BBC World Service | 5965as | 5975na | 6175na | 6195va |



FREQUENCIES

| | | | | | | | | | | | | | | | |
|------|------|-------|----------------------------------|---------|---------|---------|---------|------|------|-------|----------------------------------|---------|---------|---------|---------|
| 2300 | 0000 | | Anguilla, Caribbean Beacon | 6090am | | | | 2300 | 0000 | mtwhf | USA, WBCQ Monticello ME | 9330na | | | |
| 2300 | 0000 | vl | Australia, ABC/Alice Springs | 4835do | | | | 2300 | 0000 | | USA, WEWN Birmingham AL | 9385na | 9975eu | 13615na | |
| 2300 | 0000 | vl | Australia, ABC/Katherine | 5025do | | | | 2300 | 0000 | | USA, WGTG McCaysville GA | 5085va | 6890am | | |
| 2300 | 0000 | vl | Australia, ABC/Tennant Creek | 4910do | | | | 2300 | 0000 | | USA, WHRA Greenbush ME | 7580na | | | |
| 2300 | 0000 | | Australia, Radio | 9660pa | 12080va | 17715pa | 17795va | 2300 | 0000 | | USA, WHRI Noblesville IN | 5745na | 9495sa | | |
| | | | | 21740va | | | | 2300 | 0000 | | USA, WINB Red Lion PA | 13570am | | | |
| 2300 | 0000 | | Bulgaria, Radio | 9400na | 11700na | | | 2300 | 0000 | | USA, WJCR Upton KY | 7490va | 13595sa | | |
| 2300 | 0000 | vl | Cameroon, RTV/Yaounde | 4850do | | | | 2300 | 0000 | a | USA, WRMI Miami FL | 9955am | | | |
| 2300 | 0000 | | Canada, CBC Northern Service | 9625do | | | | 2300 | 0000 | | USA, WRNO New Orleans LA | 7355na | | | |
| 2300 | 0000 | | Canada, CFRX Toronto ON | 6070do | | | | 2300 | 0000 | | USA, WSHB Cypress Crk SC | 13770eu | 15285sa | | |
| 2300 | 0000 | | Canada, CFVP Calgary AB | 6030do | | | | 2300 | 0000 | | USA, WTJC Newport NC | 9370na | | | |
| 2300 | 0000 | | Canada, CKZN St John's NF | 6160do | | | | 2300 | 0000 | | USA, WWCR Nashville TN | 7435na | 9475na | 12160na | 13845na |
| 2300 | 0000 | | Canada, CKZU Vancouver BC | 6160do | | | | 2300 | 0000 | vl | Vanuatu, Radio | 3945do | 4960do | 7260do | |
| 2300 | 0000 | | Costa Rica, R for Peace Intl | 15049va | | | | 2300 | 0000 | | Zambia, Christian Voice | 4965do | | | |
| 2300 | 0000 | | Costa Rica, University Network | 5030am | 6150va | 7375na | 9725na | 2300 | 2305 | vl | Nigeria, Radio/Enugu | 6025do | | | |
| | | | | 11870va | 13749af | | | 2300 | 2305 | vl | Nigeria, Radio/Ibadan | 6050do | | | |
| | | | | 9900am | | | | 2300 | 2305 | vl | Nigeria, Radio/Kaduna | 4770do | 6090do | 7275do | 9570do |
| 2300 | 0000 | | Egypt, Radio Cairo | 11985as | 13785as | | | | | | | | | | |
| 2300 | 0000 | a | Finland, YLE/R Finland | 3366do | 4915do | | | 2300 | 2305 | vl | Nigeria, Radio/Lagos | 3326do | 4990do | | |
| 2300 | 0000 | vl | Ghana, Ghana BC Corp | 7410as | 9705as | 9950as | 11620as | 2300 | 2315 | | Vatican City, Vatican Radio | 9600as | 11830as | | |
| 2300 | 0000 | | India, All India Radio | 13625as | | | | 2300 | 2330 | | Canada, R Canada International | 5960am | 9755am | 11895an | 13670am |
| | | | | 4885do | 4915do | 4935do | | | | | | 15305am | 17695am | | |
| 2300 | 0000 | vl | Kenya, Kenya BC Corp | 5100do | | | | 2300 | 2330 | | Cuba, Radio Havana | 9550am | | | |
| 2300 | 0000 | | Liberia, R Liberia International | 7295do | | | | 2300 | 2330 | | Mexico, R Mexico International | 5985am | 9705am | | |
| 2300 | 0000 | | Malaysia, Radio | 5980do | | | | 2300 | 2330 | | USA, VOA Special English | 7190as | 9545as | 9795as | |
| 2300 | 0000 | | Malaysia, RTM Kota Kinabalu | 3270af | 3289af | | | | | | | 11925as | | | |
| 2300 | 0000 | | Namibia, Namibian BC Corp | 3935do | | | | 2300 | 2345 | | Germany, Deutsche Welle | 9815as | 12055as | 13610as | 21790as |
| 2300 | 0000 | | New Zealand, ZLXA | 9965as | 9955as | 9985as | | 2300 | 2345 | | USA, WYFR Okeechobee FL | 11740na | | | |
| 2300 | 0000 | | Palau, KHBN/Voice of Hope | 3316do | | | | 2300 | 2356 | | China, China Radio International | 5990na | | | |
| 2300 | 0000 | vl/as | Sierra Leone, Sierra Leone BS | 5020do | | | | 2300 | 2359 | | New Zealand, R New Zealand Intl | 17675va | | | |
| 2300 | 0000 | vl/a | Solomon Islands, SIBC | 9545do | | | | 2300 | 2359 | | Romania, R Romania International | 9690eu | 11775na | 11830eu | 15105na |
| 2300 | 0000 | | Solomon Islands, SIBC | 4940do | | | | | | | | | | | |
| 2300 | 0000 | | Sri Lanka, Sri Lanka BC Corp | 3915as | 5965as | 5975na | 6035as | 2330 | 0000 | as | Canada, R Canada International | 11895am | 15305am | 17695am | |
| 2300 | 0000 | | UK, BBC World Service | 6175na | 6195as | 7110as | 9590na | 2330 | 0000 | | Kirgiziya, Kirgiziya Radio | 4010eu | | | |
| | | | | 11945as | 11955as | 12095sa | 15280na | 2330 | 0000 | | Malaysia, RTM Sarawak | 7160do | | | |
| 2300 | 0000 | as | UK, Global Kitchen/Merlin | 3955eu | 6140eu | 7325eu | | 2330 | 0000 | | Netherlands, Radio | 6165na | 9845na | | |
| 2300 | 0000 | | USA, Armed Forces Network | 4278am | 6458am | 12689am | | 2330 | 0000 | | USA, VOA Special English | 6060as | 7190as | 7200as | 7225as |
| 2300 | 0000 | | USA, KAJL Dallas TX | 13815va | | | | | | | | 9545as | 9795as | 11805as | |
| 2300 | 0000 | | USA, KTVN Salt Lake City UT | 15590na | | | | | | | | 11925as | 13735as | 15205as | |
| 2300 | 0000 | | USA, KWHR Naalehu HI | 17510as | | | | 2330 | 2345 | vl | Libya, Voice of Africa | 11815af | 15415af | 17725va | |
| 2300 | 0000 | | USA, Voice of America | 7215as | 9770as | 11760as | 15185as | 2330 | 2357 | | Vietnam, Voice of | 9840as | 12019as | | |
| | | | | 15290as | 15305as | 17735as | 17820as | 2330 | 2359 | | Canada, R Canada International | 5960am | 9755am | 13670am | |
| 2300 | 0000 | | USA, WBCQ Monticello ME | 7415na | | | | | | | | | | | |

SELECTED PROGRAMS

Daily

2300 R. Australia: News
2300 USA, VOA Special English: News
2300 USA, VOA News Now: World News
2305 USA, VOA Special English: All About English (educational feature)
2310 USA, VOA News Now: Regional News (news from the regions to
which VOA is broadcasting)
2314 USA, VOA News Now: US News
2318 USA, VOA News Now: Sports (reports/scores)
2318 USA, VOA News Now: Sports (reports/scores)
2322 USA, VOA News Now: US feature (a report about the US)
2330 USA, VOA Special English: News (in special English)
2330 USA, VOA News Now: World News

Sunday

2300 USA, WBQ: Le Show (music/comedy/variety w/Harry Shearer)
2310 R. Australia: Correspondents' Report (round-up of global stories)
2320 R. Australia: Earthbeat (regional environmental issues)
2333 USA, VOA News Now: Women in Business [2nd Sun. only]
2333 USA, VOA News Now: Kaleidoscope (aspects of American culture
w/Susan Logue)[exc. 2nd Sun.]
2340 USA, VOA Special English: Words and Their Stories (etymology)
2345 USA, VOA Special English: 20th Century Americans (important
people of the century)

Monday

2300 USA, WBCQ: Hal Turner Show
2320 R. Bulgaria: Sports (weekend results in Europe/Bulgaria)
2330 All India R.: Sports Round-up (reports/interviews/Indian sport)
2330 R. Australia: Innovations (inventions/new practices)
2340 USA, VOA Special English: Development Report
2345 USA, VOA Special English: This Is America (life in the US)

Monday-Friday

2336 USA, VOA News Now: Dateline (news background/analysis)
2345 USA, VOA News Now: Science, Medicine and the Environment
2349 USA, VOA News Now: Business and Economic News
2354 USA, VOA News Now: General feature report (a topical report)

2305 R. Habana Cuba: Time Out (Cuban sports) M-Sa
2310 R. Australia: Asia Pacific (regional current events analysis) M-Th

Tuesday

2300 USA, WBCQ: A Voice in the Wilderness
2330 R. Australia: Arts Talk (cultural current events)
2340 USA, VOA Special English: Agriculture Today (brief farming report)
2345 USA, VOA Special English: Science in the News (latest developments in science)

Wednesday

2300 USA, WBCQ: Tomorrow's News Today (Biblical revelations and news)
2330 R. Australia: Rural Reporter (people/life in Australia's regions)
2330 USA, WBCQ: World of Radio (news of shortwave radio)
2340 USA, VOA Special English: Science Report
2345 USA, VOA Special English: Explorations (reports on space/stars/human body)

Thursday

2300 USA, WBCQ: Table of Truth
2330 Germany, Deutsche Welle: Spotlight on Sport (weekly sports report)
2330 R. Australia: Media Report (how the media operate)

2330 USA, WBCQ: Steppin' Out of Babylon
2340 USA, VOA Special English: Science Report
2345 USA, VOA Special English: Making of a Nation (US history)

Friday

2300 USA, WBCQ: Fred Flintstone Music Show (rock/pop)
2305 R. Australia: Book Reading (from Australian literature)
2315 R. Australia: Lingua Franca (discussions about language)
2330 R. Australia: In Conversation (interviews on science topics)
2330 USA, WBCQ: The Real Amateur Radio Show
2340 USA, VOA Special English: Environment Report
2345 USA, VOA Special English: American Mosaic (student life/popular culture)

Saturday

2300 R. Australia: Australia All Over (Australian stories/traditions/
music)[cont'd from 2005]
2300 USA, WBCQ: A Victory Song with Brenda and Caroll Farley
2305 R. Australia: Ockham's Razor (science issues)[Nov.-Mar. only]
2333 USA, VOA News Now: Our World
2340 USA, VOA Special English: In the News
2345 USA, VOA Special English: American Stories

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

Larry Baysinger/WJCR; Tony Berry, Canada; Martin Gallas, Jacksonville, IL; Glenn Hauser, Enid, OK/*World of Radio, DX Report*; Hans Johnson, WY/Ulis Fleming, MD /*Cumbre DX/DXing With Cumbre*; George Woods/*Media Scan*; BBCM; *BBC On-Air*; Harold Sellers, *DX Ontario*; *Hard Core DX*; Radio Sweden/*Media Scan*; Usenet Newsgroups; *Worldwide DX Club*;

How To Use This Table

The *Monitoring Times* propagation table is set up to cover three main areas of the continental US and similar circuits are calculated for each area. If you live in Canada or along the 49th parallel, and have access to the Internet, you can check the following sites for similar tables for the Canadian and northern US users at <http://www.odxa.on.ca/rac2txt99.htm>.

In the *MT* tables and on the Canadian web site, the OWF (Optimum Working Frequency) frequency for a particular circuit is displayed. This frequency should give you the best chance, 90% of the time, to hear a station located at the other end of the circuit. If you feel adventurous, look up higher than the OWF for possible signals.

The tabulated OWF is approximately equivalent to 80% of the MUF (Maximum Usable Frequency) so you could still go up in frequency in your search for a signal. For example, if the tabulated OWF is 8.0 MHz, the MUF would be 10 MHz, so you could go lurking in the upper reaches up to 10 MHz. When you reach the MUF, your chances of hearing a good signal have now decreased to about 10%. When the solar activity is high you might find some of the MUF in the 35 to 45 MHz area; you never know what you can find "up there."

The OWF can, at times, have a calculated value of "0". This value is replaced by an asterisk (*) and the cells are shaded in the *Monitoring Times* chart and on the Web pages. When you see this, do not despair; keep on looking in the vicinity of the last frequency listed for that circuit. The reason why the OWF can have a calculated value of "0" is simply that the ALF (Absorption Frequency) on this circuit, at that particular time of day, is higher than the OWF and, in theory, communication at the OWF should be impossible. But I have been in the radio field long enough to know that theory and practice do not always agree!

As it is relatively safe to assume reciprocity in the forecasts most of the time, the *MT* circuits are labeled "TO/FROM." There are some technical arguments against this assumption, but we know that the *MT* forecasts have been used with success by overseas listeners to listen to North American broadcasts.

A "P" after the name of a circuit indicates that the signal on that particular circuit can be influenced by auroral zone disturbances while traveling over the pole.

Enjoy DXing and use the propagation charts to help you locate unusual signals.

OPTIMUM WORKING FREQUENCIES (MHz)

For September 2000 Flux=183 SSN=143

Predictions prepared using ASAPS for Windows®

| UTC | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| TO/FROM US WEST COAST | | | | | | | | | | | | | | | | | | | | | | | | |
| CARIBBEAN | 21 | 19 | 17 | 16 | 14 | 13 | 11 | 11 | 10 | 11 | 10 | 10 | 10 | 12 | 15 | 17 | 18 | 19 | 19 | 19 | 19 | 20 | 21 | 21 |
| SOUTH AMERICA | 19 | 20 | 22 | 19 | 17 | 15 | 14 | 13 | 13 | 13 | 13 | 13 | 12 | 16 | 22 | 25 | 24 | 23 | 22 | 22 | 22 | 22 | 21 | 19 |
| WESTERN EUROPE | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | * | * | * | * | * | * | 13 | 15 | 16 | 17 | 17 | 17 | 16 | 14 | 12 | * |
| EASTERN EUROPE (P) | * | 10 | 10 | 10 | 11 | 12 | 11 | * | * | * | * | * | * | * | 13 | 14 | 16 | 17 | 17 | 15 | 13 | * | * | * |
| NORTH AFRICA | 16 | 16 | 16 | 15 | 14 | 13 | 12 | 11 | * | * | * | * | * | * | 15 | 16 | 18 | 19 | 19 | 20 | 20 | 19 | 17 | 16 |
| CENTRAL AFRICA | 21 | 20 | 19 | 17 | 14 | 13 | 12 | * | * | * | * | * | * | * | 15 | 17 | 18 | 19 | 20 | 20 | 20 | 19 | 20 | 20 |
| SOUTH AFRICA | 22 | 17 | 16 | 16 | 14 | 15 | 13 | * | * | * | * | * | * | 15 | 17 | 19 | 20 | 21 | 21 | 21 | 22 | 22 | 23 | 23 |
| MIDDLE EAST (P) | 14 | 14 | 14 | 17 | 15 | 13 | * | * | * | * | * | * | * | * | 13 | 14 | 17 | 18 | 19 | 17 | 16 | 15 | 15 | 14 |
| CENTRAL ASIA (P) | 16 | 19 | 20 | 19 | 17 | 14 | * | * | * | * | * | * | 10 | 11 | 12 | 14 | 15 | 15 | 14 | 14 | 14 | 14 | 13 | 14 |
| INDIA (P) | 20 | 20 | 20 | 19 | 17 | 14 | * | * | * | * | * | * | 10 | 10 | 12 | 14 | 15 | 17 | 18 | 18 | 18 | 16 | 15 | 15 |
| THAILAND | 20 | 20 | 21 | 20 | 18 | 16 | * | * | * | * | * | 10 | 10 | 10 | 11 | 14 | 15 | 17 | 18 | 19 | 19 | 17 | 16 | 19 |
| AUSTRALIA | 27 | 27 | 27 | 26 | 25 | 22 | 18 | 16 | 15 | 14 | 14 | 14 | 13 | 13 | 13 | 15 | 19 | 17 | 15 | * | * | 19 | 26 | 27 |
| CHINA | 20 | 20 | 21 | 19 | 18 | 15 | 13 | * | * | * | 10 | 10 | 10 | 10 | 11 | 13 | 15 | 14 | 14 | 15 | 15 | 14 | 16 | 19 |
| JAPAN | 20 | 20 | 20 | 19 | 18 | 15 | 13 | 12 | 11 | 10 | 9 | 9 | 10 | 10 | 11 | 13 | 13 | 13 | 13 | 13 | 17 | 19 | 19 | 19 |
| SOUTH PACIFIC | 24 | 24 | 24 | 23 | 21 | 18 | 16 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 12 | 15 | 13 | 17 | 23 | 24 | 25 | 24 | 24 | 24 |
| TO/FROM US MIDWEST | | | | | | | | | | | | | | | | | | | | | | | | |
| CARIBBEAN | 23 | 19 | 17 | 15 | 14 | 13 | 12 | 12 | 11 | 11 | 11 | 12 | 16 | 21 | 23 | 23 | 23 | 24 | 23 | 23 | 24 | 25 | 24 | 24 |
| SOUTH AMERICA | 22 | 23 | 22 | 20 | 18 | 17 | 17 | 17 | 16 | 15 | 15 | 15 | 20 | 27 | 29 | 28 | 27 | 26 | 25 | 26 | 25 | 25 | 24 | 23 |
| WESTERN EUROPE | 12 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | * | * | 14 | 16 | 17 | 18 | 19 | 19 | 18 | 18 | 18 | 16 | 14 | 13 |
| EASTERN EUROPE (P) | 10 | 9 | 9 | 9 | 10 | 11 | 10 | * | * | * | * | * | 12 | 14 | 15 | 17 | 18 | 17 | 17 | 16 | 14 | 12 | 11 | 10 |
| NORTH AFRICA | 16 | 16 | 16 | 14 | 13 | 12 | 11 | * | * | * | * | * | 14 | 16 | 17 | 18 | 19 | 20 | 20 | 20 | 20 | 19 | 17 | 16 |
| CENTRAL AFRICA | 22 | 21 | 18 | 17 | 15 | 14 | 13 | 12 | * | * | * | * | 17 | 19 | 20 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 |
| SOUTH AFRICA | 22 | 17 | 16 | 16 | 14 | 15 | 14 | 14 | * | * | * | * | 18 | 21 | 22 | 23 | 23 | 24 | 23 | 23 | 24 | 24 | 25 | 25 |
| MIDDLE EAST | 15 | 14 | 14 | 15 | 14 | 13 | * | * | * | * | * | * | 14 | 16 | 17 | 18 | 19 | 20 | 19 | 18 | 16 | 15 | 15 | 15 |
| CENTRAL ASIA (P) | 15 | 18 | 17 | 15 | 14 | * | * | * | * | * | * | 12 | 13 | 15 | 16 | 17 | 17 | 16 | 15 | 14 | 13 | 13 | 13 | 13 |
| INDIA | 17 | 18 | 17 | 15 | * | * | * | * | * | * | * | * | 12 | 14 | 15 | 17 | 18 | 19 | 18 | 18 | 17 | 16 | 15 | 15 |
| THAILAND | 20 | 19 | 18 | 16 | * | * | * | * | * | * | * | 10 | 11 | 12 | 14 | 16 | 18 | 19 | 19 | 20 | 19 | 16 | 15 | 20 |
| AUSTRALIA | 25 | 25 | 25 | 23 | 19 | 17 | 15 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 16 | 19 | 20 | 17 | 15 | * | * | 19 | 25 | 25 |
| CHINA (P) | 20 | 19 | 18 | 16 | 14 | * | * | * | * | * | 10 | 11 | 11 | 13 | 14 | 16 | 15 | 14 | 14 | 14 | 14 | 14 | 15 | 19 |
| JAPAN | 20 | 20 | 19 | 17 | 15 | 13 | 12 | 11 | 10 | 10 | 10 | 10 | 10 | 11 | 14 | 14 | 14 | 14 | 13 | 14 | 17 | 19 | 19 | 19 |
| SOUTH PACIFIC | 26 | 26 | 25 | 22 | 18 | 16 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 14 | 19 | 15 | 14 | 19 | 26 | 26 | 26 | 26 | 27 | 26 |
| TO/FROM US EAST COAST | | | | | | | | | | | | | | | | | | | | | | | | |
| CARIBBEAN | 15 | 13 | 12 | 11 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 11 | 15 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 17 |
| SOUTH AMERICA | 20 | 21 | 20 | 19 | 18 | 17 | 17 | 16 | 14 | 14 | 13 | 18 | 25 | 26 | 26 | 25 | 24 | 23 | 23 | 23 | 23 | 23 | 21 | 20 |
| WESTERN EUROPE | 12 | 12 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 13 | 16 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 18 | 18 | 16 | 14 | 13 |
| EASTERN EUROPE | 10 | 10 | 10 | 9 | 10 | 12 | 11 | 11 | 11 | * | 12 | 15 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 16 | 14 | 12 | 11 | 11 |
| NORTH AFRICA | 16 | 15 | 15 | 15 | 14 | 14 | 13 | 13 | 12 | * | 14 | 17 | 20 | 20 | 21 | 21 | 22 | 22 | 22 | 22 | 20 | 18 | 17 | 16 |
| CENTRAL AFRICA | 22 | 21 | 18 | 17 | 16 | 15 | 15 | 15 | 14 | * | 16 | 19 | 22 | 22 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 22 | 22 |
| SOUTH AFRICA | 22 | 17 | 16 | 16 | 14 | 16 | 16 | 15 | 15 | * | 17 | 24 | 26 | 27 | 28 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 27 | 26 |
| MIDDLE EAST | 16 | 15 | 14 | 15 | 14 | 13 | * | * | * | * | * | 17 | 19 | 19 | 20 | 21 | 22 | 22 | 21 | 20 | 18 | 16 | 16 | 16 |
| CENTRAL ASIA (P) | 14 | 16 | 16 | 15 | 13 | * | * | * | * | * | 13 | 15 | 17 | 18 | 19 | 19 | 18 | 17 | 15 | 14 | 13 | 14 | 14 | 13 |
| INDIA (P) | 15 | 17 | 15 | 14 | * | * | * | * | * | * | * | 14 | 16 | 17 | 19 | 20 | 20 | 20 | 18 | 18 | 17 | 17 | 16 | 15 |
| THAILAND | 19 | 17 | 16 | 14 | * | * | * | * | * | * | * | 13 | 15 | 16 | 18 | 19 | 20 | 20 | 20 | 20 | 19 | 16 | 15 | 19 |
| (P) AUSTRALIA | 25 | 24 | 20 | 18 | 16 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 14 | 18 | 21 | 22 | 20 | 17 | 15 | * | * | 20 | 25 | 25 |
| CHINA (P) | 19 | 17 | 16 | 14 | * | * | * | * | * | * | 11 | 12 | 14 | 16 | 17 | 16 | 15 | 14 | * | 13 | 14 | 14 | 14 | 17 |
| JAPAN | 21 | 19 | 17 | 16 | 14 | 13 | 12 | 11 | 11 | 11 | 12 | 12 | 13 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 17 | 19 | 21 | 21 |
| SOUTH PACIFIC | 28 | 26 | 22 | 19 | 17 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 17 | 21 | 19 | 16 | 16 | 23 | 30 | 30 | 30 | 29 | 28 | 28 |

* Unfavorable conditions: Search around the last listed frequency for activity.

(P) denotes circuit across polar auroral zone; reception may be poor during ionospheric disturbances.

Live from Radio Australia: The 2000 Olympics

By now, you've almost certainly heard that **NBC**, the American television network holding the rights to broadcast the 2000 Sydney Olympics in the United States, has decided that it will not broadcast any events "live," as they take place. In an age when information not only travels quickly but on several "highways" simultaneously, what chance will there be for any suspense and immediacy for those relying on NBC's coverage? Is there any place where the person who would like to have a little of that excitement can turn?

Why yes, shortwave – and *shortwave alone* – provides this alternative!

❖ Radio Australia Steps Up

To me, perhaps the most admirable thing about **Radio Australia** is the way that it consistently finds a way to deal, in a constructive and effective way, with the hard challenges with which it seems to be almost regularly presented. Even with a severely truncated budget and limited transmission facilities, this wireless equivalent of "The Little Engine That Could" has planned what English Service Manager John Westland calls "a two-pronged attack" to perceptively address the need to provide an international audience with comprehensive coverage of the Sydney Olympics.

❖ First, A Dedicated Olympics Channel

This service, headed by the Australian Broadcasting Corporation's sports department and anchored at radio station 2BL in Sydney, will carry "wall to wall" coverage of the Games on shortwave. Westland points out that if one is a regular listener to Radio Australia's weekend *Grandstand* relays, there will be many familiar names among the presenters and announcers.

It all starts at 2100 UT on Friday, September 15 (which, by the way, is 0800 Australia eastern summer time on Saturday). The broadcast will open with the domestic **ABC Radio** news and current affairs program *AM* and then cross to the Games themselves around 30 minutes into the broadcast. This pattern will hold every day but Saturday, while the Games are in progress. Saturdays at 2100 UT the broadcast will begin with the final hour of *Australia All Over* and then cross to the Games coverage.

This service will continue each day until 1300 UT (midnight, Sydney time), a full sixteen hours a day, through the completion of the



Games. Westland advises that, from time to time, the broadcast will return to local programming at 2BL Sydney, giving a "non-Games flavour" to the broadcasts for short bursts. Through the day, the service also will relay the regular **ABC Radio** domestic current affairs programs, *The World Today* and *PM*, but in shortened versions.

Since the ABC's sports department coverage is designed primarily for domestic Australian consumption, it will be heavily oriented toward Australian competitors. But, Westland assures, all the big events will be covered whether there is Australian participation or not.

The frequency schedule for this special Olympics service will be:

2100-0000 UT on 17715 kHz
0000-0200 UT on 17580 kHz
0200-0800 UT on 13605 kHz
0800-1300 UT on 11650 kHz

Radio Australia Transmissions Manager Nigel Holmes believes these frequencies will give is the best coverage across the day to Papua New Guinea, the Pacific and beyond. "The specific aerial we are using," says Westland, "is directed at 30 degrees (heading east) and has a broad azimuth giving us reasonable reception from about due north to close to 90 degrees."

North America is well within the azimuth of this transmission beam and at least parts of this broadcast should be receivable here. At my location in New York, I have had success hearing all these frequencies during at least a portion of the periods listed above. However, the primary target for these broadcasts is an area that requires the signal to take more than one "hop" to get to North America. This means that the 100 kilowatt signal will already be attenuated some by the time it makes the trip over the Pacific. Your (and my) success in hearing them during the Olympics will depend on overall propagation conditions, receiving location (city or country, living in a wood or metal structure, east or west) and the quality of the receiver and antenna being used.

❖ Second, Special Reports on the General Service

The remainder of Radio Australia's frequencies will carry the *General English Service*, as per usual, which will build Olympics updates and reports into its regular schedule. There will

be five reports on weekdays and four on weekends, each of ten to fifteen minutes duration, presented by either Brendon Telfer, RA's own sports correspondent, or John

Westland. These reports will focus heavily on the performances of athletes from the Asia-Pacific region.

The times and frequencies for these bulletins are as follows:

Weekdays:

0030 UT on 21740, 17795, 17750, 15240, 12080, 9660 kHz
0330 UT on 21725, 17750, 15515, 15415, 15240, 12080, 9660 kHz
0530 UT on 21725, 15515, 15240, 12080, 9660 kHz
0730 UT on 21725, 17750, 15415, 15240, 12080, 9660 kHz
1130 UT on 21820, 12080, 9580, 6020, 5995 kHz

Saturday:

0030 UT on 21740, 17795, 17750, 15240, 12080, 9660 kHz
0330 UT on 21725, 17750, 15515, 15415, 15240, 12080, 9660 kHz
0730 UT on 21725, 17750, 15240, 12080, 9660 kHz
1130 UT on 21820, 12080, 9580, 6020, 5995 kHz

Sunday:

0030 UT on 21740, 17795, 17750, 15240, 12080, 9660 kHz
0330 UT on 21725, 17750, 15515, 15415, 15240, 12080, 9660 kHz
0730 UT on 21725, 17750, 15240, 12080, 9660 kHz
1130 UT on 21820, 12080, 9580, 6020, 5995 kHz

Apart from these reports carried on the General Service (which also constitutes the 24 hour Internet audio stream at <www.abc.net.au/ra>) there can be no Internet coverage. *The ABC does not hold the Internet rights.* Unfortunately, **Radio Australia** also is unable to offer a dedicated frequency to the Asian region due to a lack of transmission capacity.

❖ Other Coverage

The **BBC World Service** also will provide extensive coverage, but it was not possible to obtain information about the specifics of that coverage in time for this column. Requests to the BBC Press Office were answered with advice to refer to the World Service Internet site <www.bbc.co.uk/worldservice> and September's *BBC On Air* magazine.

Most stations likely will carry reports in their newscasts and other programs on the Olympic Games, primarily oriented toward the achievements of their own nation's teams and athletes. This month's Selected Programming in the *Shortwave Guide* section has a comprehensive listing of regular sports programming to help you plan your listening.

Until October, go team!

SATELLITE RADIO GUIDE



Audio Subcarrier Guide

Audio frequencies in MHz. All satellite/transponder coordinates are C-band unless otherwise noted.

DS=Discrete Stereo

Classical Music

| | | |
|---|-------|----------------|
| WCPE-FM (89.7) Raleigh/Durham/Chapel Hill, NC | G5, 7 | 5.58/6.12 (DS) |
| WFMT-FM (98.7) Chicago, IL—Fine Arts | G5, 7 | 6.30/6.48 (DS) |

Satellite Computer Services

| | | |
|------------|-------|------|
| Superguide | G5, 7 | 5.48 |
|------------|-------|------|

Contemporary Music

| | | |
|---|---------|-----------------|
| WPHZ-FM (96.9) Bremen, IN (South Bend market) | G4R, 15 | 6.48, 7.30 (DS) |
|---|---------|-----------------|

Country Music

| | | |
|----------------------------|--------|----------------|
| WSM-AM (650) Nashville, TN | C4, 24 | 7.38/7.56 (DS) |
|----------------------------|--------|----------------|

Easy Listening Music

| | | |
|---|-------|-----------|
| FCC mandated safe-harbor program audio-easy listening music | G5, 2 | 6.80 |
| United Video—easy listening music | C4, 8 | 5.895 (N) |

Foreign Language Programming

| | | |
|--|---------|----------------|
| La Cadena CNN Radio Noticias (CNN Radio News in Spanish) | G5, 17 | 7.56 |
| Radio Tropical | G11, 12 | 7.60 |
| SRC AM Network | E2, 1 | 7.38 |
| SRC FM Network | E2, 1 | 5.41/5.58 (DS) |

Jazz Music

| | | |
|--|-------|----------------|
| KLON-FM (88.1) Long Beach, CA., ID—Jazz-88 | G5, 2 | 5.58/5.76 (DS) |
|--|-------|----------------|

News and Information Programming

| | | |
|---------------------------------|--------|------|
| Broadcast News | E2, 1 | 5.78 |
| Cable Radio Network | G5, 2 | 8.30 |
| G11, 6 | 7.30 | |
| C1, 7 | 8.10 | |
| CNN Headline News | G5, 22 | 7.58 |
| CNN Radio News | G5, 5 | 7.58 |
| G5, 5 | 6.30 | |
| G5, 22 | 6.30 | |
| WCBS-AM (880) New York, NY—news | T4, 11 | 7.38 |

Religious Programming

| | | |
|------------------------------------|---------|----------------|
| Brother Staire Radio | G5, 6 | 6.48 |
| KHCB-FM (105.7) Houston, TX | GE1, 9 | 7.28 |
| KMUS-AM (1380), Muskogee, OK | G1R, 24 | 5.96 |
| LDS Radio Network | C1, 6 | 5.58 |
| Trinity Broadcasting radio service | G5, 3 | 5.58/5.78 (DS) |
| Truth Net | G9, 2 | 5.80 |

Shortwave Broadcasters via Satellite

| | | |
|--|-------|------|
| C-SPAN Audio 1: Various shortwave broadcasters | C3, 7 | 5.20 |
|--|-------|------|

By Robert Smathers, roberts@nmia.com

| | | |
|---|---------|--------------------------------------|
| C-SPAN Audio 2: British Broadcasting Corporation (BBC) | C3, 7 | 5.41 |
| Deutsche Welle Radio 1 | GE1, 22 | 7.38, 7.56 (DS) (German) |
| Deutsche Welle Radio 2 | GE1, 22 | 7.74 (English Language) |
| Deutsche Welle Radio 7 | GE1, 22 | 7.92 (Various Languages) |
| RAI Satelradio Italy (Italian) | G11, 14 | 7.38 |
| WEWN—Worldwide Catholic Radio, Vandiver, AL | G1R, 11 | 5.40, 7.38 (English), 5.58 (Spanish) |
| WHRA Africa/Middle East—World Harvest Radio, South Bend, IN | G4R, 15 | 7.82 |
| WHRI Americas—World Harvest Radio, South Bend, IN | G4R, 15 | 7.46 |
| WHRI Europe—World Harvest Radio, South Bend, IN | G4R, 15 | 7.55 |
| KWHR Asia—World Harvest Radio, South Bend, IN | G4R, 15 | 7.64 |
| KWHR South Pacific—World Harvest Radio, South Bend, IN | G4R, 15 | 7.73 |
| World Radio Network: WRN1 North America | G5, 6 | 6.80 |
| World Radio Network: WRN2 North America | G5, 6 | 6.20 (Multi-lingual) |

Speciality Formats

| | | |
|----------------------------------|---------|------|
| Colorado Talking Book Network | C1, 3 | 5.60 |
| Weather Channel—background music | C3, 13 | 7.78 |
| Wisdom Radio Network | GE1, 12 | 7.10 |
| GE1, 12 | 7.92 | |
| Yesterday USA—nostalgia radio | G5, 7 | 6.80 |

Talk Programming

| | | |
|---|---------|------------|
| American Freedom radio network | GE4, 19 | 5.80 |
| Christian Media Network | G9, 2 | 7.78 |
| Genesis Communications Radio Network | G1R, 17 | 5.58 |
| Genesis Communications Radio Network | G9, 2 | 7.28 |
| Heritage Broadcasting System | G11, 14 | 7.70 |
| Talk America Radio Network #1—talk programs | GE3, 9 | 6.80 |
| Talk America Radio Network #2—talk programs | GE3, 9 | 5.41 |
| Talk Radio Network (TRN) | C1, 14 | 5.80 |
| Truth Radio Network | G9, 2 | 5.40 |
| United Broadcasting Network | C1, 2 | 7.50 |
| WWTN-FM (99.7) Manchester, TN—news and talk | G5, 18 | 7.38, 7.56 |

Variety Programming

| | | |
|---|---------|-------|
| CBM-FM (88.5) Montreal, PQ Canada—variety/fine arts | E2, 1 | 6.12 |
| West Virginia Public Radio | GE1, 12 | 7.74 |
| WNMX-FM (106.1) "Mix 106" Waxhaw, NC | G1R, 17 | 7.927 |

FM SQUARED (FM²) AUDIO GUIDE

Galaxy 3R Transponder 3 (Ku-band)

| | |
|--|---|
| Blank Audio Carriers | 2.06 |
| Data transmissions | .06, .62, 2.93, 3.07 and 3.15 MHz |
| AP Network News | 3.53 MHz |
| In-Store audio network ads (various companies) | .62, .71, .81, .88, 1.05, 1.15, 1.26, 3.25, 3.44, 3.62, 3.70, 3.80, 3.88, 3.97 and 4.20 MHz |
| Muzak Services | .15, .27, .39, .51, .98, 1.36, 1.48, 1.60, 1.72, 1.84, 1.96, 2.19, 2.31, 2.44, 2.56, 2.68, 2.80, 3.34, 4.08, 4.34, and 4.45 MHz |

Galaxy 3R Transponder 16 (Ku-band)

| | |
|-------------------------|---|
| Data transmissions | .06, .47, .64, 1.95, 2.18, 2.45, 2.52, 2.82, 2.92, 3.20, 3.38, 3.47, 3.73, 3.97, 4.14, and 4.24 MHz |
| In-Store audio networks | .15, .27, .39, .99, 1.11, 1.59, 1.71, and 1.83 MHz |

Telstar 5 Transponder 28 (Ku-band)

| | |
|--------------------|---|
| Data Transmissions | .06, .15, .23, .30, .35, .38, .47, .65, .89, .93, .96, 1.05, 1.12, 1.22, 1.35 MHz |
|--------------------|---|

SATELLITE RADIO GUIDE



SATELLITE LOADING REPORT OF THE MONTH:

GE Americom GE-1 at 103 degrees West longitude

C-band

| | |
|----|--|
| 1 | Occasional video |
| 2 | (none) |
| 3 | PBS (digital) |
| 4 | Fox Sports (digital) |
| 5 | Hero Teleport (digital) |
| 6 | Data Transmissions |
| 7 | PaxNet (digital) |
| 8 | Data Transmissions |
| 9 | Fox Sports South [V2 +] |
| 10 | Data Transmissions |
| 11 | Univision (digital) |
| 12 | Wisdom Network |
| 13 | Data Transmissions |
| 14 | Data Transmissions |
| 15 | Total Life Network (digital) |
| 16 | Occasional video |
| 17 | Telemundo (digital) |
| 18 | Fox Sports (digital) |
| 19 | (none) |
| 20 | (none) |
| 21 | Univision feeds (digital) |
| 22 | Deutsche Welle TV - North American service |
| 23 | TV Games Network [V2 +] |
| 24 | Data Transmissions |

Ku-band

| Tr | Freq | Pol | Service |
|-----|---------|-----|---------------------------------|
| 1. | 11720 V | | Data Transmissions |
| 2. | 11740 H | | Data Transmissions |
| 3. | 11760 V | | NBC East/Central affiliate feed |
| 4. | 11780 H | | Data Transmissions |
| 5. | 11800 V | | (none) |
| 6. | 11820 H | | Data Transmissions |
| 7. | 11840 V | | NBC feeds |
| 8. | 11860 H | | Data Transmissions |
| 9. | 11880 V | | NBC Mountain affiliate feed |
| 10. | 11900 H | | Data Transmissions |
| 11. | 11920 V | | (none) |
| 12. | 11940 H | | Microspace Velocity (digital) |
| 13. | 11960 V | | Data Transmissions |
| 14. | 11980 H | | Data Transmissions |
| 15. | 12000 V | | NBC feeds |
| 16. | 12020 H | | DirectPC (digital) |
| 17. | 12040 V | | NBC Pacific affiliate feed |
| 18. | 12060 H | | Data Transmissions |
| 19. | 12080 V | | NBC Newschannel (digital) |
| 20. | 12100 H | | Data Transmissions |
| 21. | 12120 V | | NBC feeds (digital) |
| 22. | 12140 H | | Microspace Velocity (digital) |
| 23. | 12160 V | | NBC feeds (digital) |
| 24. | 12180 H | | Fed Ex TV (digital) |

GE Americom GSTAR-4 at 105 degrees West longitude

| | | |
|-----|---------|--------------------|
| 1. | 11730 H | Data Transmissions |
| 2. | 11791 H | Data Transmissions |
| 3. | 11852 H | Occasional video |
| 4. | 11913 H | Data Transmissions |
| 5. | 11974 H | Occasional video |
| 6. | 12035 H | Data Transmissions |
| 7. | 12096 H | Occasional video |
| 8. | 12157 H | Occasional video |
| 9. | 11744 V | Data Transmissions |
| 10. | 11805 V | Data Transmissions |
| 11. | 11866 V | Data Transmissions |
| 12. | 11927 V | Data Transmissions |
| 13. | 11988 V | Occasional video |
| 14. | 12049 V | Data Transmissions |
| 15. | 12110 V | Data Transmissions |
| 16. | 12171 V | Data Transmissions |

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Your Satellite TV Q & As

As the months have zipped by I noticed it has been some time since we last peered into the mail bag. So this month we'll dust off the reading specs and try to help those with enquiring minds.

- First up is Bill Montney who wants to know, "Which is better for the money, a C-band system, or a Ku-band system?" Specifically, Bill wants to know about the 76 cm Ku-band dish system and the 4-ft C-band system he has seen on the www.smallear.com website both of which I reviewed in previous columns.

Well, Bill, the problem with the off-set fed dishes is that they don't have polar mounts and require one to re-align the dish for reception of each different satellite, a pain in the neck to say the least. The Jonsa 4-ft dish, which has a polar mount, is not easily adaptable to being motorized. Whether or not you get a C or Ku-band system really depends on what it is you're looking for. If, like me, your interest is generally everything in the sky, a C/Ku-band system is in order. If you're interested in specific ethnic programming which is found only on one Ku-band satellite, then the 76 cm system is yours. If space is a concern and you're interested in C-band programming, the 4-ft Jonsa is the way to go.

For the whole enchilada you'll need at least a 6-ft C/Ku-band system. If money is a concern, I recommend used systems from dealers or neighbors getting rid of their big dish systems for the DBS type. You can get some terrific bargains by nosing around and asking questions.

- Barry Williams asks, "Do you know of any [radio] feeds from European stations? I have just recently re-subscribed to MT and may have missed this info."

Welcome back, Barry! What's happened in the satellite industry since you last subscribed is the influx of activity from Europe via MPEGII digital broadcasting. This is the international standard used by most European (and an increasing number of Western Hemisphere) satellite broadcasters. The interesting thing is that MPEGII receivers are relatively cheap and can

receive any MPEGII transmission (video and audio) which is unencrypted (or "Free-To-Air" as they say in the industry).

For a look at all the action which can be picked up in the U.S. on MPEGII check out www.lyngsat.com and look at Atlantic satellites Intelsat NSS 806 and Panamsat 5. You find that not only can you watch Deutsche Welle TV, but listen to Deutsche Welle Radio 1, 2, and 7 as well

ing that, it retransmits the U.S. Naval Observatory clock! Tuning in NSS 806 is a little tricky (you'll need a clear view to the southeast and a Teflon insert to compensate for the circularly polarized signal), but it's worth the effort, especially watching the video on MCM Europe's "All-European-rock-only" music channel. You won't see anything like it in the U.S. The audio quality on MPEGII receivers is excellent and the receiver can work easily with your existing big dish system.



Will C/Ku-band satellite systems become obsolete?

as RDP Antena 1 (Portugal), and Radio Timor. On NSS 806 you can hear Radio France International, Radio Italia, Radio Dimensione Suono, Radio Gal, and Syrian Radio. There are lots of South American stations, too, including RadioCapital 104.5 FM, Circuito CNB 102.3, Radio Popular, and Radio Nacional de Venezuela, Radio Panamericana, Radio Cadena Nacional and more.

There's even a channel which broadcasts Metropolitan Opera live and, when it's not do-

- Ralph Siebert writes, "I am interested in Telstar 5 programming on Ku-band, if I could scrounge a Ku-band dish for that satellite what would I be looking for? Is the old Primestar dish OK?"

Sure is, Ralph. In fact, since the old Primestar system was a "medium" power Ku-band DBS service, the feed horn/LNB on the dish should work fine. It seems to me that all you need to add is an MPEGII receiver and orient the dish to Telstar 5 (97° W). The only problem is that hamfest gear is *caveat emptor* ("Let the buyer beware"). You have no way of knowing if the LNB is fried or that it's even there. At least ordering new equipment you have a warranty.

- In a similar vein Floyd M. writes, "I would like to know what type of non broadcast signals can be received by using an RCA type LNBF with a 4' dish with a non digital receiver..."

Again, the main issue here is the LNBF. In the case of the RCA DSS service the LNBF used is for the DBS broadcast service in the 12.2 to 12.7 GHz range while standard Ku-band service is in the 11.45 to 11.75 GHz range. Setting up an analog receiver on a DSS LNBF, even on a 4-ft dish, will yield no results. And, if you were to outfit a DSS 18-in. dish with a standard Ku-band LNBF and an analog receiver you would still have no picture because standard Ku-band satellites have a much lower output relative to the high power DBS services. So, to watch standard Ku-band transmissions you have to have a standard Ku-band LNBF and at least a 3-ft. dish.

- John Stanko has a question about setting up a Ku-band dish and surface irregularities.

I've found assembling the small 76cm dish system to be very straightforward. It's true that all you have to go on is a line drawing, but the system is designed so that once all the parts are put together the system is lined up properly. The only variable is rotating the feed horn in its holder. Everything else is set. A dish reflector works best when the surface is a perfect parabolic shape. Any dings, bends or other crinkles will dramatically reduce the surface accuracy and thereby the capability of the dish to receive the optimum amount of signal regardless of whether or not you're looking at analog or digital feeds.

- Craig Daskalakis has been shopping, he says, "...I picked up a 6-ft solid dish and two receiver boxes recently, but don't know what I can pick up with them. Installation shops wanted \$500 to install it... Can you point me in the right direction in setting this up myself and what is available unscrambled?"

Good for you Craig! I've always encouraged readers to take advantage of cheap surplus gear which is widely available. First, to whet your appetite and come to terms with what's available, go to your local newsstand and buy an issue of *Satellite Entertainment Guide*, *Orbit*, or *Satellite TV Week*. That's about a \$5 or \$6 dollar investment that will show you exactly what's available unscrambled. It will also let you become familiar with the way the satellites are arranged in the Clarke Belt. You'll need this info for setting up the dish.

\$500 is typical of local dealers. They often set the price so high you'll realize that you can have a whole, brand new small dish system and a year's subscription to programming for the same price. But, if you do the installation yourself, you'll save \$500 and learn a little something at the same time. Skyvision offers a number of inexpensive installation aids ranging from their "DIY Installation Video" (\$40), the "DIY Manual" (\$20) to a complete DIY Tune-up Kit (\$150). Call their toll free number (800) 500-9275 or visit their web site at www.skyvision.com.

- John Kennedy asks a really great question, "Is it worth investing money into a satellite dish, if C/Ku-band is going to become obsolete eventually?"

This is the same question dogging shortwave listeners. Since it's just a matter of time before digital shortwave becomes the new thing, should we throw hundreds of dollars into expensive analog shortwave receivers? The answer, in my opinion, is Yes! The move to digital is a very slow process (it's already been going on for years in the satellite industry). C and Ku-band satel-

lites, each with a life expectancy of up to 15 years, are being launched and new ones are being built every year. The satellites don't care whether analog or digital transmissions are beamed at them. Today on a typical satellite we have analog C and Ku-band transmissions in the clear or using at least three types of encryption and two types of digital delivery.

The fact is that there are 10 times the number of channels which can be received today than there were just 10 years ago. The amount of video and audio services of domestic and foreign origin is truly amazing. But, the best part is that prices on all of this equipment have never been cheaper. I believe that, just as with analog shortwave, there'll be plenty of satellite DXing to be done in the years to come.

- And, finally, Bernie S. writes, "...I work some of the Ham satellites and have been a backyard astronomer for some time. In tracking the satellites, I make use of a tracking program and the Keps [Keplerian element sets] from NASA. I have never understood why, when describing the position of a geostationary satellite, the AZ [azimuth] only is given and never the EL [elevation]. Never having had the equipment to tune in on any of them, I never gave it much thought... How does someone who doesn't know where it is begin his search?"

Unlike the AMSATs, all of the broadcast satellites are geostationary in an orbit directly over the equator. They appear not to move, but, in reality, just as with the AMSATs, they are "flown" by ground controllers to assure they maintain their orbital position. Now, the best part is that the C-band dish manufacturers came up with a dish mount years ago called a polar mount, which allows the dish to "track" the Clarke Belt once just two of the satellites are found.

Finding a broadcast satellite is easier than finding your car in an empty parking lot. Unlike the AMSATs, the signals from these satellites, being video, are 36 MHz wide, quite powerful (20 watts for most C-band and up to 200 watts for Ku-band DBS) and the dishes have enormous gain (typically 40dB!). This combination makes it very easy to find a satellite just by waving the dish around in the mere direction of the Clarke Belt.

Once a glimmer from the bird is seen (or heard) at one end of the belt, making adjustments brings in a sharp picture. Now by rotating the dish to the other end of the Clarke Belt and finding another satellite, simply realign the dish for a perfect picture. Locking down the mount bolts now allows the dish to simply pivot East or West and watch the pictures from each satellite zip by the TV screen. If you have a clear shot to the most western and eastern horizons you can view satellites spanning some 125 degrees!

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Was it 15 years ago that I first heard about the highest resolution pictures available from weather satellites?

From time to time, pictures are shown on television and in the media, demonstrating the current "ultimate" pictures available from satellites such as the *Landsat* series, and the French *Spot*. These are special satellites, designed to provide scientific data for researchers. To receive such data, you need highly specified hardware (and an enormous bank balance!); you are unlikely to find receiver circuit designs published on the web!

For those determined to have "the best," all is by no means lost. A few weeks ago I took delivery of a unit from Timestep Weather Satellite Systems designed to receive high resolution picture telemetry (HRPT) from the NOAA weather satellites. In doing this, I was simply joining many other people around the world that already monitor HRPT telemetry. I knew that I would be impressed with the results – and I was not disappointed. I have spent many hours monitoring the performance of the system, and almost as many continuing with APT!

Reception of both APT and HRPT signals (on separate computers) has become common – but not for "comparison" purposes. With a roof-mounted wxsat antenna having reasonable all-round visibility, and a ground-mounted dish surrounded by tall buildings and neighbors' roofs, I have been interested to compare reception. The VHF antenna invariably "hears" the satellites first, but in some cases, the result has been unexpected. My dish is in the yard where there is no northeast horizon below about 65° elevation! Visibility improves in the northwest to about 20°. The south is usable for several degrees until my neighbor's house cuts off transmissions – leaving only a small gap before my own house again terminates the signals.

Despite this extremely limiting scenario, I have been delighted with the reception capabilities of the system. The curious experience of seeing Iceland – when the satellite passes between two tall roofs, at which time the APT sig-

nal itself can no longer produce an image – was unexpected.

Figure 2 shows an HRPT image that I received simultaneously with the Meteor 3-5 image in figure 1. The difference in spectral response is obvious, though masked a little by my need to improve the contrast of each image for publication. Side-by-side on the computer, the images show the same cloud patterns in different detail. NOAA-14 rose above my southern horizon and was received within four degrees elevation – the lowest that my horizon permits! The satellite then tracked high over the roofs on the western side, until it finally passed down between a gap between other roofs that allowed the extreme northern area near Iceland to be monitored. Unfortunately, as is often the case, Iceland was under cloud cover – so a clear HRPT image of it waits for another day.

Special Bulletin

In the early hours of July 10, 2000 I received poor HRPT telemetry from NOAA-15. On the following pass I confirmed that both APT and HRPT were badly affected, and e-mailed the Internet WXSAT forums. Wayne Winston of NOAA provided the following:

"First indications are the AVHRR scan motor is failing, which will affect both APT and HRPT. We are continuing to dig deeper into the telemetry data when the satellite is in view. You can keep abreast of N15 updates on the NOAA-15 Bulletins page at <http://140.90.207.25:8080/EBB/ml/specialbull.html>

❖ New Fengyun wxsat

Transmissions from China's geostationary wxsat Fengyun-2B failed some months back, but hot on its heels, China's latest Fengyun-2 weather satellite was launched on June 25. The launcher took off from Xichang at 1150 UTC; the third stage placed it in a parking orbit at 1201 UTC, and re-ignited for a second burn to transfer orbit, with spacecraft separation at 1213 UTC. FY-2 is spin-stabilized, similar to the older generation GOES satellites and the Himawari and Meteosat satellites. The first FY-2 was retired in April after a three year mission. By July 3, the new FY-2 was in a geo-stationary orbit drifting over the Pacific.

❖ NOAA-1 launch

As of early July, the launch date for NOAA-1 was August 29, so assuming that there are no late problems, the spacecraft should be aloft shortly. It is expected to enter an "afternoon ascending" orbital plane.

❖ Operational WXSATS

A fairly average few weeks of satellite op-

erations continued in July. Meteor 3-5 was switched off during the passage of its orbital plane through the terminator – an event that occurs every few months. Switch-off was heralded by the re-activation of Meteor 2-21 (as a replacement); this transmission on June 13 took me by surprise because it has been a very long time since Meteor 2-21 was activated. I had to check my satellite tracking program when I heard the unexpected transmission on 137.40 MHz. Meteor 3-5's 137.85 MHz APT was powered off a day or so later.

After about two days of rather poor quality image transmissions, Meteor 2-21 was powered off. Transmissions on 137.85 were reported on June 20, though I was visiting my daughter and grandson in London at this time, so I could not monitor. On return a few days later, I logged

Meteor 2-21 back on 137.40 MHz. Transmissions from Meteor 3-5 resumed on 6 July – see figure 1. Although Meteor 2-21 remained transmitting, I expect it to be switched off shortly.

Picture quality from Meteor 3-5 can be seen from figure 1 to be limited. Line jitter spoils the resolution potentially available from the onboard scanner. A replacement spacecraft is long overdue. By chance, NOAA-14 passed over Britain going in the opposite direction at the same time – see figure 2.

Transmissions from Okean-O (on 137.40 MHz) have been mostly sparse and irregular, though sometimes the satellite was operating on successive days for short periods. Its transmissions were regu-



Fig 1: Meteor 3-5 1547 UTC 6 July 2000 showing the southbound pass across Britain, Spain and north Africa.



Fig 2: NOAA-14 1552 UTC 6 July 2000

larly noted on the "rig-1" mailing list, a forum started last year and mostly carrying contributions from UK and Europe-based observers. Anyone can join by visiting the e-groups web site and searching for "rig-1."

❖ Internet site update

Knowing of the efforts that many put into keeping web sites updated with satellite images, I requested correspondents on the Internet's "wxsat-1" forum to provide site addresses for inclusion in this section. No doubt the list is incomplete, but the following sites were amongst those who replied.

<http://guru.lincoln.landcare.cri.nz/NOAA/>

Dr Stephen McNeill of Landcare Research, Lincoln, New Zealand told me that high resolution picture transmission data is received directly from the NOAA satellites and put on the web within an hour at Landcare Research's site. Between April and September, the two highest NOAA-14 passes are received, archived to tape and processed to JPG "quick looks" for their web page. One of these two passes is early morning (3-5 am NZ standard time), while the other is an afternoon pass (4-6 pm). Between October and March, when the sun angles are higher, they also collect and archive the second highest afternoon pass. A single daily pass is collected from NOAA-12 (4-6am), and processed to produce a quick look JPG image for assessing the day's weather patterns.

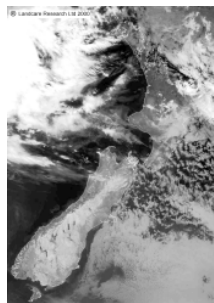


Fig 3: New Zealand – courtesy Landcare Research.

I checked out the site and found an image of New Zealand on display, together with a drop-down menu leading to the archived passes. Look at the picture of their L-band satellite dish - and drool!

<http://www.cmc.ec.gc.ca>

Ron Goodson told me that real-time GOES and NOAA images can be found on this Environment Canada web page. Check the "satellite" section. The GOES images are reduced resolution. The NOAA imagery covers northern Canada; most are from the station in Edmonton, plus a bit from a station in Resolute Bay.

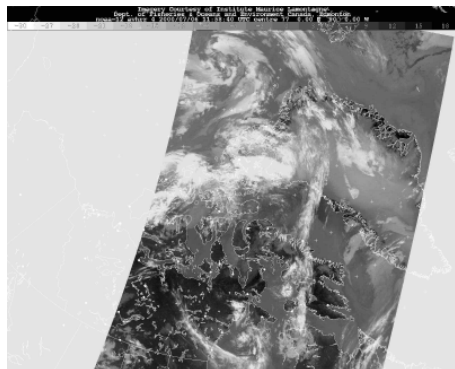


Fig 4: Image courtesy Department Fisheries, Ocean and Environment, Canada. NOAA-12 July 6.

<http://www.drdoe.com/cam>

Dale Ireland lives in Silverdale and has a web camera updating the view across the northern end of Dyes Inlet, an arm of Puget Sound, 20 miles west of Seattle, Washington State, every 30 minutes. Dale has a wide selection of archived "special feature" images, including one showing ship contrails.

<http://www3.sympatico.ca/konecny/weather.htm>

Milan Konecny, VE3NZK, maintains daily updates of color NOAA 14 and NOAA 15 images of North America on his page. Meteor 3-5 images are also included. Look for the links page that points to a large number of providers of images.

<http://www.rogeray.redhotant.com/latestimage/index.html>

Roger Ray lives in Telford, UK, and has been updating his web site with HRPT images daily for several months. In Britain, access to the Internet continues to become available in different ways. Like Roger, I have now got unmetered free access for a small monthly charge. Twelve months ago this was unheard of.

<http://uwamrc.ssec.wisc.edu>

Matthew Lazzara is a meteorologist at the Antarctic Meteorological Research Center, and suggested their site: More specifically: <http://uwamrc.ssec.wisc.edu/amrc/realtime.html> and <http://uwamrc.ssec.wisc.edu/amrc/iceberg.html>

Matthew explained that due to funding problems they do not have the real-time page operating with actual data, but they hope to get funded within the next month, and "serve the public again."

http://smis.iki.rssi.ru/data/today/sched_e.shtml

The Russian Space Monitoring Information Support laboratory maintains a schedule of NOAA HRPT reception and provides "quick-look" images of Europe from almost every NOAA pass. Images are in jpg format.

http://www.eumetsat.de/en/m_area5.html

Dr. Volker Gärtner, the User Support Manager at EUMETSAT, points out that Meteosat-7 and Meteosat-5 imagery is available from the Eumetsat site. Both monochrome and color wfax images are available, and selected PDUS images.

<http://www.goes.noaa.gov/>

The GOES geostationary satellite server provides a comprehensive choice of images from both GOES-8 (east) and GOES-10 (west) satellites. Access to an image archive is available, together with links to Meteosat-7, Meteosat-5 and GMS satellites.

www.tnrc.state.tx.us

Curt Reutner informed me of the numerous imagery cuts under the agency web site available to all. The above is the main web page for the agency. Satellite imagery is "buried deep below" starting at: www.tnrc.state.tx.us/updated/air/monops/data/satellite Most of the imagery is updated every hour, but some is updated more frequently. "We have several different cuts available primarily over the state of Texas but we do a pretty good job covering the Gulf of Mexico."

Frequencies

NOAA-12 transmits HRPT on 1698.0 MHz
NOAA-14 transmits APT on 137.62 MHz and HRPT on 1707.0 MHz
NOAA-15 transmits APT on 137.50 MHz and HRPT on 1702.5 MHz
Fengyun-1C transmits CHRPT on 1700.5 MHz
Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
Resurs 1-4 transmits APT on 137.85 MHz
Okean-O, Okean-4 and Sich-1 sometimes transmit APT briefly on 137.40 MHz
GOES-8 and GOES-10 use 1691 MHz for WEFAX

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Government Trunking Systems

This month we will look at some of the government trunking systems that have been reported to us here at *MT* headquarters. The bulk of the trunking systems will be found on standard frequencies in the 406-420 MHz range (see table one). Of course, there are exceptions and we have seen some military trunking systems in the 138-144, 148-150.8 and 162-174 MHz ranges.

❖ Bureau of Prisons

The Federal Bureau of Prisons (BOP) was established in 1930 to ensure consistent and centralized administration of the 11 Federal prisons in operation at that time. Today, the Bureau consists of 95 institutions, six regional offices, a Central Office (headquarters), three staff training centers, and 29 community corrections offices. The regional offices and the Central Office provide administrative oversight and support to the institutions and community corrections offices. Community corrections offices oversee community corrections centers and home confinement programs.

The Bureau is responsible for the custody and care of approximately 141,000 Federal offenders. About 122,000 of these inmates are confined in Bureau-operated correctional institutions or detention centers. The rest are confined through agreements with State and local governments and through contracts with privately-operated community corrections centers, detention centers, prisons, and juvenile facilities.

The Federal prison system is a nationwide system of prisons and detention facilities for the incarceration of inmates who have been sentenced to imprisonment for Federal crimes and the detention of individuals awaiting trial in Federal court. In the United States, there are also 50 State correctional systems and a correctional system for the District of Columbia. These systems are responsible for the imprisonment and detention of offenders who have been sentenced or are awaiting trial for crimes committed within their jurisdictions. (In 1997, Congress passed a law requiring the Bureau of Prisons to assume responsibility for incarcerating the District of Columbia's sentenced felon inmate population by the end of 2001.)

Scanner monitors all over the country have reported quite a few new BOP Motorola trunk systems operating in the 406-420 MHz federal land mobile band. Below is a small sample of what has been reported.

U.S. Penitentiary Florence, CO
406.550, 408.300, 408.350, 408.550, 409.150, 409.550, 409.950

Federal Correctional Institute Miami, FL
406.550, 408.950, 409.350, 409.750

Federal Correctional Institute Greenville, IL
406.350, 407.150, 407.950, 408.750, 409.150

Federal Correctional Institute Pekin, IL
406.350, 407.150, 407.950, 408.750, 409.150

U.S. Penitentiary Terre Haute, IN
406.350, 407.150, 407.950, 408.750

Federal Correctional Institute Manchester, KY
406.750, 407.550, 408.350, 409.150, 409.950

Federal Correctional Institute Cumberland, MD
406.350, 409.150, 409.350, 409.550, 409.750

Federal Correctional Institute Butner, NC
406.350, 406.550, 406.750, 407.150, 407.950, 408.150, 408.350, 408.750, 409.150, 409.950

Federal Correctional Institute Fort Dix, NJ
408.225, 408.750, 409.425, 412.425, 413.650

Metropolitan Detention Center Brooklyn, NY
407.950, 408.550, 408.750, 409.750

Federal Correctional Institute/U.S. Penitentiary Allenwood, PA
406.350, 406.750, 406.950, 407.150, 407.950, 408.350, 408.750, 408.950, 409.550, 409.950

Federal Correctional Institute (Schuylkill) Minersville, PA
406.550, 408.550, 409.150, 409.250, 409.350, 409.750

Federal Correctional Institute Estill, SC
406.350, 407.150, 407.950, 408.750, 409.550

Federal Correctional Institute, Fort Worth, TX
408.350, 411.175, 412.425, 413.650

❖ Department of Energy

The Department of Energy (DOE) has been in the news lately with wildfires threatening several DOE labs. Below are a few of the DOE trunking systems that have been identified. More information is requested on these systems from monitors in the field.

Rocky Flats Office, CO
406.350, 406.750, 407.150, 407.950, 408.150, 408.750, 408.950, 409.350, 409.750, 410.150

Pinellas Plant, Saint Petersburg, FL
406.750, 407.550, 408.550, 409.150, 409.950

Idaho DOE Facilities, ID
406.350, 407.150, 407.950, 408.750, 409.550

Los Alamos National Labs, NM
406.350, 407.150, 407.950, 408.750, 409.550

Sandia National Labs, Albuquerque, NM (Kirtland)
406.550, 406.950, 408.150, 408.350, 409.950

DOE Las Vegas/Nevada Test Site, Las Vegas, NV
406.550, 406.750, 407.550, 407.950, 408.850

Oak Ridge National Labs, TN
406.350, 407.150, 407.950, 408.750, 409.550

Hanford Environmental Health Foundation, WA
406.350, 406.750, 407.150, 407.350, 407.950, 408.150, 408.750, 408.950, 409.550, 409.750

❖ Veterans Administration

The VA Medical Center (VAMC) in Dallas is reported to host a four channel SmartNet II+ trunking system which will support over 400 users. This system has been designed to accommodate the unique requirements of the Dallas VAMC with a simple, reliable, and flexible system which is open to future growth.

The system design and analysis has been completed. We have had three frequencies reported with this system: 408.200, 411.5375, and 413.825 MHz.

❖ Customs Service

Several readers have reported a possible 400 MHz trunking system associated with the US Customs Service in Orlando, Florida. No additional details are available at presstime.

Table One: Fed Trunking Standard Groups

| Base Frequency | Trunk Group | Mobile Frequency |
|----------------|-------------------|------------------|
| 406.350 | Group 1/Channel A | 415.150 |
| 407.150 | Group 1/Channel B | 415.950 |
| 407.950 | Group 1/Channel C | 416.750 |
| 408.750 | Group 1/Channel D | 417.550 |
| 409.550 | Group 1/Channel E | 418.350 |
| 406.750 | Group 2/Channel A | 414.750 |
| 407.550 | Group 2/Channel B | 415.550 |
| 408.350 | Group 2/Channel C | 416.350 |
| 409.150 | Group 2/Channel D | 417.150 |
| 409.950 | Group 2/Channel E | 417.950 |
| 406.550 | Group 3/Channel A | 415.350 |
| 407.350 | Group 3/Channel B | 416.150 |
| 408.150 | Group 3/Channel C | 416.950 |
| 408.950 | Group 3/Channel D | 417.750 |
| 409.750 | Group 3/Channel E | 418.550 |
| 406.950 | Group 4/Channel A | 414.950 |
| 407.750 | Group 4/Channel B | 415.750 |
| 408.550 | Group 4/Channel C | 416.550 |
| 409.350 | Group 4/Channel D | 417.350 |
| 410.150 | Group 4/Channel E | 418.150 |

❖ Unidentified Systems

Brian Cathcart found two government systems while traveling through the Newark International Airport recently. No additional information is available on who owns these two systems.

Newark International Airport, NJ (Motorola Type II, four channel)
System ID = 3517 [no antenna needed inside airport to hear this one]
Trunking file: MAP=22222222, OPTIONS=nVdxf, PLAN=0 413.700, 415.150, 415.950, 418.350

Newark International Airport, NJ (Motorola Type II, four channel)
System ID = 3726 Trunking file:MAP=22222222, OPTIONS=nVdxf, PLAN=0 407.950, 408.550, 408.750, 409.750

Brian has also reported this unidentified government trunking system at the Atlanta Hartsfield Airport in Georgia.

Atlanta Hartsfield Airport, GA (Motorola Type II)
System ID = 482F
Trunking File: MAP=22222222, OPTIONS=nVdxf, PLAN=0 406.4125, 408.5375, 410.1250

❖ VHF Low Band Assignments

This month we will finish our look at the 30-50 MHz federal government low band assignments in table one. Next month we will start profiling the 138-144 MHz band.

Table Two: Federal Frequency Allocations: VHF Low Band

| | | | | | |
|--------|---|--------|--|--------|---|
| 40.000 | Air Force, U.S. Fish and Wildlife | 40.970 | Coast Guard (Nationwide), EPA, Federal Highway Administration (Nationwide), Interior Department (Nationwide) | 41.900 | Air Force, Army, Navy |
| 40.010 | Air Force, Bureau of Indian Affairs, Energy Department (Nationwide), Interior Department (Nationwide), TVA | 40.975 | Army | 41.910 | Navy |
| 40.030 | Bureau of Indian Affairs, Interior Department (Nationwide), TVA | 40.990 | Bureau of Indian Affairs, Coast Guard (Nationwide), Interior Department (Nationwide) | 41.925 | Army |
| 40.050 | Army, Bureau of Indian Affairs, Interior Department (Nationwide), Navy | 41.000 | Air Force, Army, Navy | 41.930 | Air Force, Navy |
| 40.070 | Interior Department (Nationwide), National Park Service (Nationwide), Postal Service (Nationwide) | 41.010 | Interior Department (Nationwide) | 41.940 | Army |
| 40.075 | Army | 41.020 | Bureau of Reclamation (Nationwide) | 41.950 | Air Force (Nationwide), Army, Navy |
| 40.090 | Army (Nationwide) | 41.030 | Army, Energy Department, Interior Department (Nationwide) | 41.970 | FBI (Nationwide) |
| 40.100 | Air Force, Army (Nationwide), Navy | 41.050 | Navy | 41.975 | Army |
| 40.110 | Army (Nationwide) | 41.060 | FCC (Nationwide) | 41.980 | Energy Department (Nationwide), FBI (Nationwide), Immigration and Naturalization Service (Nationwide) |
| 40.125 | Air Force, Army | 41.075 | Army | 46.600 | Air Force |
| 40.130 | Air Force, Navy | 41.090 | Energy Department (Nationwide), Navy | 46.610 | Energy Department |
| 40.150 | Air Force, Army, Navy | 41.100 | Air Force, Army, Navy | 46.625 | Air Force, Army |
| 40.170 | Air Force, FBI (Nationwide) | 41.110 | Navy | 46.630 | Bureau of Land Management (Nationwide), Interior Department (Nationwide) |
| 40.175 | Air Force, Army | 41.130 | Bureau of Mines, Interior Department (Nationwide), National Park Service | 46.640 | Navy |
| 40.190 | Air Force, FBI (Nationwide) | 41.140 | Bureau of Indian Affairs | 46.650 | Air Force, Army, FBI (Nationwide), Navy |
| 40.200 | Air Force, Army | 41.150 | Air Force, Army, Interior Department (Nationwide), Navy | 46.670 | Navy |
| 40.210 | FBI (Nationwide), National Park Service (Nationwide) | 41.170 | Secret Service (Nationwide), WHCA (Nationwide) | 46.690 | Army (Nationwide), Navy |
| 40.225 | Army | 41.190 | Secret Service (Nationwide), WHCA (Nationwide) | 46.700 | Army (Nationwide), Navy |
| 40.230 | FBI (Nationwide) | 41.200 | Air Force, Navy | 46.710 | Army (Nationwide), Navy |
| 40.250 | Air Force, Army, Environmental Research Lab (Great Lakes), Navy | 41.210 | Coast Guard (Nationwide), Transportation Department | 46.725 | Army |
| 40.260 | Federal Highway Administration (Nationwide) | 41.225 | Army | 46.730 | Air Force, NASA, National Ocean Service, Navy |
| 40.270 | Environmental Research Lab (Great Lakes), National Ocean Service (Coastal Waters) | 41.230 | Coast Guard (Nationwide) | 46.750 | Agriculture Department (Nationwide), Air Force, Animal and Plant Health Service, Army, Navy |
| 40.275 | Army | 41.250 | Army, Navy | 46.760 | Navy |
| 40.290 | Environmental Research Lab (Nationwide), Maritime Administration, National Ocean Service (Nationwide) | 41.270 | Bureau of Land Management (Nationwide), Interior Department (Nationwide), Treasury Department (Nationwide) | 46.770 | Agriculture Department (Nationwide), Forest Service (Nationwide), Navy |
| 40.310 | Bureau of Indian Affairs, Environmental Research Lab (Great Lakes) | 41.300 | Navy | 46.775 | Army |
| 40.330 | Bureau of Indian Affairs, Veterans Administration | 41.310 | Air Force, Energy Department (Nationwide) | 46.790 | Army (Nationwide), Navy |
| 40.350 | Air Force, Army, General Services Administration (Nationwide), Navy | 41.330 | Coast Guard (Nationwide) | 46.800 | Air Force, Army |
| 40.370 | Bureau of Indian Affairs, Coast Guard (Nationwide), Indian Health Services, Interior Department (Nationwide) | 41.350 | Agriculture Department (Nationwide), Bureau of Indian Affairs, Centers for Disease Control, Interior Department (Nationwide), Navy | 46.810 | Bureau of Land Management (Nationwide), Energy Department, Interior Department (Nationwide), Mine Safety and Health Administration (Nationwide) |
| 40.390 | Coast Guard (Nationwide), Federal Highway Administration (Nationwide), Interior Department (Nationwide), U.S. Fish and Wildlife Service | 41.370 | Bureau of Reclamation (Nationwide), Coast Guard (Nationwide), Transportation Department (Nationwide) | 46.850 | Air Force (Nationwide), Navy |
| 40.400 | Air Force, Navy | 41.390 | Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide) | 46.870 | Army |
| 40.410 | Bureau of Indian Affairs, Interior Department (Nationwide) | 41.400 | Air Force, Army, Coast Guard (Coastal Areas), Navy | 46.890 | Army (Nationwide), Navy |
| 40.425 | Army | 41.410 | Coast Guard (Nationwide), Federal Highway Administration, Transportation Department (Nationwide) | 46.900 | Air Force, Army (Nationwide), Coast Guard, FEMA, Navy |
| 40.430 | Bureau of Indian Affairs, Geologic Survey (Nationwide), Interior Department (Nationwide), TVA | 41.425 | Army | 46.910 | Army (Nationwide), Navy |
| 40.450 | Air Force, Army, Navy, Veterans Administration | 41.430 | Army, Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide) | 46.950 | Agriculture Department (Nationwide), Air Force, Army, Forest Service, Navy |
| 40.470 | Energy Department | 41.450 | Air Force (Nationwide), Navy | 46.970 | Agriculture Department (Nationwide), Forest Service (Nationwide) |
| 40.475 | Army, Environmental Research Lab | 41.470 | Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide) | 46.990 | Bureau of Land Management (Nationwide), Interior Department (Nationwide) |
| 40.490 | Army (Nationwide), TVA | 41.475 | Army | 49.610 | Bureau of Land Management (Nationwide), Interior Department (Nationwide), Mine Safety and Health Administration (Nationwide) |
| 40.500 | Air Force, Army (Nationwide), Coast Guard (Nationwide), Navy (Nationwide), TVA | 41.490 | Army | 49.625 | Army |
| 40.510 | Army (Nationwide), Corps of Engineers | 41.500 | Air Force, Army (Nationwide), FEMA | 49.630 | Energy Department (Nationwide), Navy, Soil Conservation Service |
| 40.525 | Army | 41.510 | Army (Nationwide) | 49.640 | Environmental Research Lab |
| 40.530 | Navy, Soil Conservation Service, TVA | 41.530 | Army, Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide), National Institutes of Health, Soil Conservation Service (Nationwide) | 49.650 | Agriculture Department (Nationwide), Air Force, Army, Energy Department, Forest Service, Navy |
| 40.550 | Air Force, Army, Navy | 41.550 | Army, Bureau of Land Management (Nationwide), Interior Department (Nationwide), Navy | 49.670 | Agriculture Department (Nationwide), Forest Service (Nationwide), Navy, Soil Conservation Service |
| 40.570 | Bureau of Reclamation, Interior Department (Nationwide), TVA, U.S. Fish and Wildlife Service (Nationwide) | 41.570 | Coast Guard (Nationwide), Treasury Department (Nationwide) | 49.675 | Army |
| 40.590 | Bureau of Mines, Interior Department (Nationwide) | 41.575 | Army | 49.690 | Army (Nationwide), Navy |
| 40.600 | Air Force, Navy | 41.590 | Army, FAA (Nationwide) | 49.700 | Army (Nationwide) |
| 40.610 | Coast Guard (Nationwide), TVA | 41.600 | Army, Navy | 49.710 | Army (Nationwide), Navy |
| 40.620 | TVA | 41.610 | Agriculture Department (Nationwide), Forest Service (Nationwide) | 49.730 | Air Force, Bureau of Land Management (Nationwide), Interior Department (Nationwide), NASA, Navy |
| 40.630 | Coast Guard (Nationwide), Transportation Department, TVA | 41.625 | Army | 49.750 | Air Force, Army, FBI (Nationwide), NASA, Navy |
| 40.650 | Air Force, Interior Department (Nationwide), TVA | 41.630 | Bureau of Indian Affairs, EPA (Nationwide), Interior Department (Nationwide) | 49.770 | Air Force, Bureau of Land Management (Nationwide), Interior Department (Nationwide), Navy |
| 40.660 | National Park Service, U.S. Fish and Wildlife Service | 41.650 | Air Force, Army, Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide), Navy | 49.790 | Army (Nationwide), NASA, Navy |
| 40.670 | Interior Department (Nationwide) | 41.670 | Energy Department, Treasury Department (Nationwide) | 49.800 | Air Force, Army (Nationwide), Energy Department, Environmental Research Lab, Navy |
| 40.680 | Air Force | 41.675 | Army | 49.810 | Army (Nationwide), Navy |
| 40.690 | Bureau of Land Management, Interior Department (Nationwide), TVA | 41.690 | Coast Guard (Nationwide), Education Department (Nationwide), Health and Human Services (Nationwide) | 49.820 | Veterans Administration |
| 40.700 | Air Force, Army, Navy | 41.700 | Air Force, Army, Coast Guard (Coastal Areas), Navy | 49.830 | NASA, National Ocean Service, Navy |
| 40.710 | Interior Department (Nationwide) | 41.710 | Coast Guard (Nationwide), Oil Spill (Nationwide) | 49.845 | Army (Nationwide) |
| 40.725 | Army | 41.725 | Army | 49.850 | Air Force (Nationwide), Army, Navy |
| 40.730 | Interior Department (Nationwide), TVA, U.S. Fish and Wildlife Service | 41.730 | Coast Guard (Nationwide), Transportation Department (Nationwide) | 49.860 | Energy Department, EPA (Nationwide), U.S. Fish and Wildlife Service (Nationwide) |
| 40.740 | TVA | 41.750 | Air Force, Army, Coast Guard (Nationwide), Navy | 49.890 | Energy Department, Postal Service, Veterans Administration |
| 40.750 | Air Force, Interior Department (Nationwide), National Park Service, Navy, TVA | 41.770 | Bureau of Indian Affairs, Bureau of Land Management, Interior Department (Nationwide) | 49.900 | Air Force, Army, Navy |
| 40.770 | Navy, TVA | 41.775 | Army | 49.910 | Bureau of Land Management (Nationwide), Interior Department (Nationwide), Mine Safety and Health Administration (Nationwide), NASA, Navy |
| 40.775 | Army | 41.790 | Coast Guard (Nationwide), Education Department (Nationwide), Forest Service, Health and Human Services (Nationwide) | 49.920 | Energy Department, Environmental Research Lab, NASA |
| 40.790 | Navy | 41.800 | Army, Navy | 49.925 | Army |
| 40.800 | Air Force, Army, Navy | 41.810 | Energy Department | 49.930 | Army (Nationwide), Coast Guard, Navy |
| 40.810 | National Archives | 41.830 | Coast Guard (Nationwide), Indian Health Service, National Institutes of Health | 49.940 | Air Force |
| 40.820 | Navy | 41.850 | Army, Navy, Secret Service (Nationwide), WHCA (Nationwide) | 49.950 | Agriculture Department (Nationwide), Air Force (Nationwide), Army, Forest Service, NASA, Navy |
| 40.825 | Army | 41.870 | Secret Service (Nationwide), WHCA (Nationwide) | 49.970 | Agriculture Department (Nationwide), Forest Service (Nationwide), Navy, Soil Conservation Service |
| 40.830 | Navy, TVA | 41.875 | Army | 49.975 | Army |
| 40.850 | Air Force, Army, Bureau of Indian Affairs, Interior Department (Nationwide), Navy, TVA | | | | |
| 40.860 | Treasury Department | | | | |
| 40.870 | Interior Department (Nationwide), NASA, TVA | | | | |
| 40.875 | Army | | | | |
| 40.900 | Army (Nationwide), Navy | | | | |
| 40.910 | Army (Nationwide) | | | | |
| 40.930 | Army (Nationwide) | | | | |
| 40.950 | Army (Nationwide), Navy | | | | |

Can These Trunked Systems Deliver?

If you read the advertising put out by companies that manufacture trunked radio systems, you'd think they always perform easily and reliably for the public safety agencies that purchase them. In many cases the systems do work well; however, there are always glitches in any complex system. Sometimes the glitches can be minor, such as an occasional missed transmission, and sometimes they can be life-threatening.

❖ Orange County, California

Back in July officials in Orange County, California, announced they would stop the roll-out of their \$80 million trunked radio system due to a significant number of failures, several of which put lives at risk. A new Motorola 800 MHz digital ASTRO system is being tested by police departments in Irvine and Tustin, who have reported significant gaps in coverage, garbled messages, and even radios that drain vehicle batteries. On several occasions officers have been unable to call for assistance, their transmissions being blocked or otherwise prevented from reaching the dispatcher.

Some of the problems have been blamed on inadequate coverage from transmission towers and some on the nature of 800 MHz signals. Older radio systems operating in the 400 MHz band have better penetration into buildings and underground garages and are not subject to nearby interference from cellular telephone towers, which also operate in the 800 MHz range.

While the bugs are being worked out you should still be able to hear Main Dispatch in conventional mode on 460.4250 MHz and 507.1125 MHz.

The new Orange County system is supposed to replace a patchwork of incompatible radio networks operated by different agencies within the county. Six primary transmitters and 21 remote sites will use more than 80 frequencies, including:

856.2125, 856.4625, 856.7125, 856.9625, 857.2125, 857.4625, 857.7125, 857.9625, 858.2125, 858.4625, 858.7125, 858.9625, 859.2125, 859.4625, 859.7125, 859.9625, 860.2125, 860.4625, 860.7125, 860.9625, 866.100, 866.125, 866.150, 866.175, 866.200, 866.325, 866.350, 866.375, 866.400, 866.425, 866.450, 866.600, 866.625, 866.650, 866.675, 866.700, 866.825, 866.850, 866.875, 866.900,

866.925, 867.100, 867.125, 867.150, 867.175, 867.200, 867.325, 867.35, 867.375, 867.400, 867.425, 867.600, 867.625, 867.650, 867.675, 867.700, 867.825, 867.850, 867.875, 867.900, 867.925, 868.100, 868.125, 868.150, 868.175, 868.200, 868.325, 868.350, 868.375, 868.400, 868.425, 868.600, 868.625, 868.650, 868.675, 868.700, 868.825, 868.85, 868.875, and 868.925 MHz.

In the meantime, Orange County Fire continues to operate three older Motorola Type I analog systems, each with half a dozen or so channels.

Countywide activity occurs on 856.2125, 856.7125, 857.2125, 857.7125, 858.2125, 859.2125, and 860.2125 MHz. 860.9625 MHz may occasionally be in use as a talk-around channel (direct mobile-to-mobile rather than through the repeater). Suggested fleet maps for TrunkTracker users include Block 0 with size code 2 and Block 4 with size code 13. Some reported talkgroups are:

200-0 - Administrative
200-1 - Tactical
200-2 - Command
200-3 - Dispatch
200-4 - Countywide

400-1 - Orange County Dispatch
400-2 - Command
400-3 - Area Dispatch
400-4 - Division 1 Tactical North
400-5 - Division 2 Tactical Central
400-6 - Division 3 Tactical South
400-7 - Laguna Beach Tactical
400-8 - San Clemente Tactical
400-14 - John Wayne Airport Tactical
Paramedics operate on 462.950 MHz.

The **North County** system operates on 856.9625, 857.4625, 858.4625, 859.4625, 859.9625, and 860.4625 MHz, covering the cities of Anaheim, Brea, Buena Park, Fullerton, Garden Grove, Orange, and Stanton. For TrunkTrackers, Block 0 should have a size code of 2 and Block 4 a size code of 13. The 400-series talkgroup is also in use in this system:

400-1 Administrative
400-2 Alternate Dispatch
400-3 Command

400-4 Metro Net Dispatch
400-5 Anaheim Tactical
400-6 Brea Tactical
400-7 Buena Park Tactical
400-8 Fullerton Tactical
400-9 Garden Grove Tactical
400-10 La Habra Tactical
400-11 Orange Tactical
400-12 Stanton Tactical

Central County operations occur on 856.4625, 857.9625, 858.7125, 858.9625, 859.7125, and 860.7125 MHz. This system includes Costa Mesa, Fountain Valley, Huntington Beach, Newport, and Santa Ana. TrunkTrackers should use a size code of 11 in Block 2 and a size code of 13 in Block 4.

300-1 Santa Ana Administration
300-2 Santa Ana Tactical
300-3 Santa Ana Command
300-4 Santa Ana Dispatch "71"

400-1 Administrative
400-2 Alternate Dispatch
400-3 Command
400-4 Metro Net Dispatch
400-5 Costa Mesa Tactical
400-6 Fountain Valley Tactical
400-7 Huntington Beach Tactical
400-8 Newport Beach Tactical
400-9 Santa Ana Tactical
400-12 Costa Mesa Tactical 2
400-13 Santa Ana Tactical 2

❖ State of Florida

The Motorola 800 MHz ASTRO digital trunked SmartZone system installed for State of Florida is probably the most notorious example of trunked radio system problems. The network is geographically large, covering most of the southern part of the state. The primary user is the Florida Highway Patrol, although it is shared with numerous other state and Federal agencies.

The system apparently worked well during Hurricane Georges in September 1998 when the state quickly added some emergency talkgroups that allowed different agencies to coordinate their efforts. They also made use of the telephone interconnect feature to patch messages directly through to officer's radios from telephones in the state capitol and elsewhere.

More recently, however, as more and more users began making use of the system, trouble came in the form of blocked transmissions and significant gaps in coverage. Even worse, parts of the system would "freeze" or crash, rendering radios useless and almost always leaving officers at risk.

Problems were bad enough that the state task force recently awarded the statewide radio project to Com-Net Ericsson, a competitor of Motorola's. The system will reportedly not change to EDACS (Enhanced Digital Access Communications System), but it will be a challenge to regain the confidence of the system's users.

Since the system uses digital voice coding, even trunked scanner listeners are not able to hear the voice portion of the conversation, but the frequencies in use are:

853.9625, 854.0125, 854.0375, 854.0875, 854.1125, 854.1375, 854.1875, 854.2375, 854.2625, 854.2875, 866.4500, 866.9375, 866.9625, 866.9750, 866.9875, 867.4375, 867.4500, 867.4750, 867.9375, 867.9500, 867.9625, 867.9750, 867.9875, 868.4500, 868.4625, 868.4750, 868.4875, 868.9375, 868.9500, 868.9625, 868.9750 and 868.9875MHz.

❖ Metro-Dade County, Florida

Motorola isn't the only vendor facing unhappy customers. Just a few years ago Ericsson paid \$3 million in fines for contractual non-performance as it struggled to fix problems with their \$43 million Metro-Dade, Florida, 800 MHz EDACS network. Digital signal processing delays, gaps in coverage, poor reception, and lousy audio quality topped the list of problems in a system that was reportedly designed to handle more than 30 million transmissions per month.

In October 1998 the county finally accepted the system. More than 17,000 radios went into operation, served through seven repeater sites. Forty operating channels are shared across several independent systems that serve different user groups.

The local government and fire system operates on:

866.1125, 866.3625, 866.6125, 866.8625, 867.1375, 867.3875, 867.6625, 867.9125, 868.2625, 868.5125, 866.1375, 866.3875, 866.6375, 866.8875, 867.2875, 867.5375, 868.1125, 868.3625, 868.6125, and 868.8625 MHz.

Fire operations use Agency codes 00, 01, 02, and 03. In particular:

02-000 Agency-wide fire
02-020 Fire dispatch
02-021 North dispatch
02-022 Central dispatch
02-023 South dispatch
02-024 Airport operations

02-085 Public information
02-120 EMS operations
02-121 EMS operations
03-041 Air operations
03-042 Air operations
03-043 Air operations
03-044 Air operations
03-045 Air dispatch

The primary public safety system operates on

866.0375, 866.2875, 866.7625, 867.0625, 867.4125, 867.7875, 868.1375, 868.3875, 868.6375, 868.8875, 866.0625, 866.3125, 866.5625, 866.8125, 867.1125, 867.3625, 867.5625, 867.8125, 868.1625 and 868.4125 MHz.

04-020 Police dispatch (fleetwide)
04-021 Miami Lakes dispatch
04-022 North Side dispatch
04-023 Doral dispatch
04-024 Cutridge dispatch
04-025 Kendall dispatch
04-026 Intercoastal dispatch
04-027 Municipal dispatch
04-030 Hammocks dispatch

04-040 Tactical car to car (fleetwide)
05-041 Air operations
05-042 Air operations
05-043 Air operations

❖ Kansas City, Missouri

In 1998, four Kansas City firefighters trapped in a burning house found their EDACS radios wouldn't work as they called for help. They eventually escaped, but the incident brought to a head problems that had been unresolved with the system. After a lot of finger-pointing the city finally admitted they had not done their part to effectively specify the performance they needed, and spent more than \$8 million to upgrade the original \$18 million system.

The frequencies are, in Logical Channel Number (LCN) order:

856.2125, 857.2125, 858.2125, 859.2125, 860.2125, 856.4625, 857.4625, 858.4625, 859.4625, 860.4625, 856.2625, 857.2625, 858.2625, 859.2625, 860.2625, 856.7375, 857.7375, 858.7375, 859.7375, 860.7375, 856.4375, 857.4375, 858.4375, 859.4375 and 860.4375 MHz.

Kansas City Fire Ground Channels

866.4875 Fire Ground 1
867.0500 Fire Ground 2
867.4125 Fire Ground 3
868.4875 Fire Ground 4
860.4375 Talk-Around

As an aside, North Kansas City has a rather unusual setup. They have five frequencies and use Motorola equipment, but they're not actually trunking. Each frequency is dedicated to a specific purpose, just like a conventional system. There is no control channel.

856.7125 Police 1
857.7125 Police 2
858.7125 Fire 2
859.7125 Public Works
860.7125 Fire 1

There are a few cars equipped with EDACS radios to allow officers to communicate with the Kansas City police.

❖ Tallahassee, Florida

The City of Tallahassee, Florida, is trying to do things right. They are continuing to expand their \$13 million Motorola Type II trunked radio system, now including Leon County and the Leon County Sheriff's Office. Prior to the additions, the original 13 voice channels were shown to be performing well with a traffic load averaging between 25,000 and 45,000 transmissions per day with an average dispatch time of 5 seconds. This is about a third of the maximum capability of the system.

Five voice channels were added to support Leon County and the Leon County Sheriff's Office, which experience an average of 11,000 daily transmissions. One additional channel would be added to handle the Florida A&M Police Department, who has also requested to use the 800 MHz system.

Assigned frequencies are:

851.0000, 854.9625, 855.4625, 855.9625, 856.4625, 856.7125, 856.9625, 857.2125, 857.4625, 857.7125, 857.9625, 858.2125, 858.4625, 858.7125, 858.9625, 859.2125, 859.4625, 859.7125, 859.9625, 860.2125, 860.4625, 860.7125, and 860.9625 MHz.

That's all for this month. Keep the frequency lists and talkgroup charts coming to dan@signalharbor.com, and check my website at www.signalharbor.com for more information. Until next month, happy monitoring!

Longwave Resources

✓ **Sounds of Longwave** 60-minute Audio Cassette featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more! \$11.95 postpaid

✓ **The BeaconFinder** A 65-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz. \$11.95 postpaid

Kevin Carey
P.O. Box 56, W. Bloomfield, NY 14585

New Zealand VHF band plan for 29-88 MHz

This month's *Service Search* column is a special treat for the low band DXers (the fall/winter months in the northern hemisphere are prime time for VHF low band skip). Thanks to Ian Julian, ZL1TBM in Hamilton, New Zealand, and the VHF skip news group for the New Zealand band plan (www.egroups.com).

And from my personal files, we start a complete look (minus most federal government assignments; see *Fed File* column) at US low band allocations beginning with 25-30 MHz.

| | |
|-----------------|--|
| 29.640 | 10-meter FM repeater - Auckland (Ponga Hill Papakura) |
| 29.700-30.000 | Remote control/telemetry |
| 29.835-29.995 | Remote control channels 1-10 |
| 30.000-31.300 | Land mobile (Defense usage)/Cordless phones |
| 30.075-30.775 | Cordless phones (Base)/39.775-40.475 (Handset) |
| 30.800-32.000 | Wireless microphones/in-house paging/Restricted radiation devices (RRDs) (Baby monitors) |
| 31.300-31.600 | Wireless microphones/in-house paging |
| 31.375 | McDonald's restaurants wireless microphones (common usage) |
| 31.400 | Wendy's restaurants wireless microphones (common usage) |
| 31.425 | McDonald's restaurants wireless microphones (common usage) |
| 31.575 | McDonald's restaurants wireless microphones (common usage) |
| 32.000-35.400 | Fixed/Land mobile (Defense usage)/Cordless phones |
| 34.2875-34.475 | Cordless phones (Base)/40.2625-40.4625 (Handsets) |
| 35.400-36.000 | Radio microphones/Industrial, Scientific, Medical (ISM) and some Defense usage |
| 35.700 | Industrial, Scientific, Medical (ISM) |
| 36.000-36.600 | Remote control/telemetry |
| 36.050 | Remote control channel #1 |
| 36.150 | Remote control channel #2 |
| 36.250 | Remote control channel #3 |
| 36.350 | Remote control channel #4 |
| 36.450 | Remote control channel #5 |
| 36.550 | Remote control channel #6 |
| 36.600-37.200 | Wireless microphones/RRDs (Baby monitors) |
| 37.200-39.000 | Fixed/Land mobile (Defense usage) |
| 39.000-39.700 | RRDs (Baby monitors) |
| 39.775-40.475 | Cordless phones (Handset)/30.075-30.775 (Base) |
| 40.2625-40.4625 | Cordless phones (Handset)/34.2875-34.475 (Base) |
| 40.500-41.000 | Remote control/telemetry/ISM/RRDs (Baby Monitors) |
| 40.680 | Industrial, Scientific, Medical (ISM) |
| 41.000-44.000 | Fixed/Land mobile (Defense usage) |
| 44.000-51.000 | Television channel 1 |
| 45.240 | Television channel 1 vision carrier |
| 45.250 | Television channel 1 vision carrier |
| 45.260 | Television channel 1 vision carrier |
| 50.040 | ZL3SIX 6-meter amateur radio beacon - Christchurch, South Island |
| 50.050-50.150 | 6-meter amateur band DX window (Restricted usage, special conditions apply) |
| 50.052 | 6-meter amateur radio beacon - Greymouth, South Island |
| 50.740 | Television channel 1 sound carrier |
| 50.750 | Television channel 1 sound carrier |
| 50.760 | Television channel 1 sound carrier |
| 51.000-53.000 | New Zealand 6-meter amateur radio band |
| 51.030 | 6-meter amateur radio beacon - Napier, North Island |
| 51.100 | Television channel 1 NICAM stereo sound carrier |

| | |
|-------------------|--|
| 52.250 | 6-meter amateur radio beacon - Palmerston North, North Island |
| 52.490 | ZL2SIX 6-meter amateur radio beacon - Blenheim, South Island |
| 53.000-54.000 | Fixed/Land mobile (Defense usage) and 6-meter repeaters (approval required) |
| 53.625 | 6-meter amateur radio repeater - Alexandra, South Island |
| 53.750 | 6-meter amateur radio repeater - Colonial Knob, North Island |
| 54.000-68.000 | Television channels 2 and 3 |
| 55.240 | Television channel 2 vision carrier |
| 55.250 | Television channel 2 vision carrier |
| 55.260 | Television channel 2 vision carrier |
| 60.740 | Television channel 2 sound carrier |
| 60.750 | Television channel 2 sound carrier |
| 60.760 | Television channel 2 sound carrier |
| 61.100 | Television channel 2 NICAM stereo sound carrier |
| 62.240 | Television channel 3 vision carrier |
| 62.250 | Television channel 3 vision carrier |
| 62.260 | Television channel 3 vision carrier |
| 67.740 | Television channel 3 sound carrier |
| 67.750 | Television channel 3 vision carrier |
| 67.760 | Television channel 3 vision carrier |
| 68.000-74.800 | Fixed AB band/Some defense usage |
| 68.0125-69.9875 | Simplex channels ABX1-159 |
| 68.100 | Television channel 3 NICAM stereo sound carrier |
| 70.0125-71.7875 | Alpha TX channels AB1-143 |
| 71.8125-71.9875 | Simplex channels ABX160-174 |
| 72.000-73.000 | Wireless microphones/Cordless phones/RRDs |
| 73.0125-74.7875 | Fixed AB band channels AB1-143 Beta TX |
| 74.800-75.200 | Aeronautical marker beacons |
| 75.000 | Instrument Landing Systems (ILS) |
| 75.225-76.2875 | Land mobile emergency services A band (ESA) (Police/Fire) (Base) channels ESA1-86/78.10625-79.16875 (Mobile) |
| 76.300 | Police simplex |
| 76.400 | Police simplex |
| 76.4125-78.100 | Not allocated |
| 78.10625-79.16875 | Land mobile channels ESA1-86 (Mobile)/75.225-76.2875 (Base) |
| 79.200-80.000 | Not allocated |
| 80.0125-80.5125 | Land mobile simplex channels AX01-41 |
| 80.525-81.000 | Land mobile A band channels AS01-539 (Base)/84.49375-84.96875 (Mobile) |
| 81.0125-84.025 | Land mobile A band A1-242 (Base)/84.98125-87.99375 (Mobile) |
| 84.0375-84.475 | Land mobile simplex AX101-136 |
| 84.98125-87.99375 | Land mobile A band A1-242 (Mobile)/81.0125-84.025 (Base) |

United States VHF Low Band Assignments Service Legend:

| | |
|---------------|---|
| BA | Remote Broadcast Pick-up (TV, radio) |
| CB | Citizens Band |
| CD | Paging and Radiotelephone |
| IA | Industrial/Business Pool General Assignment |
| IP | Petroleum Service |
| IW | Power Service |
| LR | Railroad Service |
| PF | Fire Service |
| PH | Highway Maintenance Service |
| PM | Emergency Medical Service |
| PO | Forestry/Conservation Service |
| PP | Police Service |
| PP State | Police Service |
| PS | Special Emergency Service |
| PX | Public Safety Pool General Assignment |
| RP | Broadcast Remote Pickup |
| XC | Experimental Service: Contract (Dev) |
| XD | Experimental Service: Developmental |
| XE | Experimental Service: Export |
| XR | Experimental Service: Research |
| 24.990-25.005 | Standard Frequency and Time Signal |
| 25.005-25.010 | Standard Frequency and Time Signal/Space Research |

| | |
|---------------|--|
| 25.010-25.070 | Fixed/Mobile (except aeronautical mobile) |
| 25.02 | IP Base or mobile |
| 25.04 | IP Base or mobile Oil Spill Containment |
| 25.06 | IP Base or mobile |
| 25.070-25.210 | Maritime Mobile |
| 25.08 | IP Base or mobile Oil Spill Containment |
| 25.10 | IP Base or mobile |
| 25.12 | IP Base or mobile |
| 25.14 | IP Base or mobile |
| 25.1526 | DoD Worldwide TSN Net 3 [USB] |
| 25.16 | IP Base or mobile |
| 25.18 | IP Base or mobile |
| 25.20 | IP Base or mobile |
| 25.210-26.330 | Fixed/Mobile (except aeronautical mobile) |
| 25.22 | IP Base or mobile |
| 25.24 | IP Base or mobile |
| 25.26 | IP Base or mobile |
| 25.28 | IP Base or mobile |
| 25.30 | IP Base or mobile |
| 25.32 | IP Base or mobile |
| 25.330-25.550 | Fixed/Mobile [Government] (except aeronautical mobile) |
| 25.344 | NCS Nationwide: National Communications System [USB] |
| 25.347 | NCS Nationwide: National Communications System [USB] |
| 25.350 | USCS Worldwide: Cothen Network Scan 10 [USB] |
| 25.363 | USAF Andersen AB, Guam [USB] |
| 25.550-25.670 | Radio Astronomy |
| 25.670-26.100 | Broadcasting (including international broadcasting) |
| 25.87 | BA |
| 25.91 | BA |
| 25.95 | BA |
| 25.99 | BA |
| 26.03 | BA |
| 26.07 | BA |
| 26.09 | BA |
| 26.100-26.175 | Maritime Mobile [Various] |
| 26.11 | BA |
| 26.13 | BA |
| 26.15 | BA |
| 26.17 | BA |
| 26.175-26.480 | Land Mobile |
| 26.19 | BA |
| 26.21 | BA |
| 26.23 | BA |
| 26.25 | BA |
| 26.27 | BA |
| 26.29 | BA |
| 26.31 | BA |
| 26.33 | BA |
| 26.35 | BA |
| 26.37 | BA |
| 26.41 | BA |
| 26.43 | BA |
| 26.45 | BA |
| 26.47 | BA |
| 26.480-26.950 | Fixed/Mobile [Government] (except aeronautical mobile) |
| 26.617 | CAP US Air Force: Civil Air Patrol [AM mode] |
| 26.620 | CAP US Air Force: Civil Air Patrol-Search and Rescue [AM mode] |
| 26.859 | DoD Nightwatch Airborne Command Post Net Zulu 335 [USB] |
| 26.910 | USAF US Air Force MARS-Nationwide [USB] |
| 26.955 | International Fixed Public |
| 26.965 | CB Channel 1 |
| 26.975 | CB Channel 2 |
| 26.985 | CB Channel 3 |
| 26.995 | CC |
| 27.005 | CB Channel 4 |
| 27.015 | CB Channel 5 |
| 27.025 | CB Channel 6 |
| 27.035 | CB Channel 7 |
| 27.045 | CC |
| 27.055 | CB Channel 8 |
| 27.065 | CB Channel 9 |

| | |
|---------------|--|
| 27.075 | CB Channel 10 |
| 27.085 | CB Channel 11 |
| 27.095 | CC |
| 27.105 | CB Channel 12 |
| 27.115 | CB Channel 13 |
| 27.120 | Industrial, Scientific, Medical (+/- 160 kHz) |
| 27.125 | CB Channel 14 |
| 27.135 | CB Channel 15 |
| 27.145 | CC |
| 27.155 | CB Channel 16 |
| 27.165 | CB Channel 17 |
| 27.175 | CB Channel 18 |
| 27.185 | CB Channel 19 |
| 27.195 | CC |
| 27.205 | CB Channel 10 |
| 27.215 | CB Channel 21 |
| 27.225 | CB Channel 22 |
| 27.235 | CB Channel 24 |
| 27.245 | CB Channel 25 |
| 27.255 | CB Channel 23 |
| 27.265 | CB Channel 26 |
| 27.275 | CB Channel 27 |
| 27.285 | CB Channel 28 |
| 27.295 | CB Channel 29 |
| 27.305 | CB Channel 30 |
| 27.315 | CB Channel 31 |
| 27.325 | CB Channel 32 |
| 27.335 | CB Channel 33 |
| 27.345 | CB Channel 34 |
| 27.355 | CB Channel 35 |
| 27.365 | CB Channel 36 |
| 27.375 | CB Channel 37 |
| 27.385 | CB Channel 38 |
| 27.395 | CB Channel 39 |
| 27.405 | CB Channel 40 |
| 27.430 | IA Base or mobile |
| 27.450 | IA Base or mobile |
| 27.470 | IA Base or mobile |
| 27.490 | IA Base or mobile Itinerant |
| 27.510 | IA Mobile Low Power 2 watts |
| 27.530 | IA Mobile Low Power 2 watts |
| 27.540-28.000 | Fixed/Mobile [Government] |
| 27.555 | IF Base or mobile (secondary to government communications) |
| 27.565 | USA US Army MARS [USB] |
| 27.615 | IF Base or mobile (secondary to government communications) |
| 27.635 | IF Base or mobile (secondary to government communications) |
| 27.655 | IF Base or mobile (secondary to government communications) |
| 27.736 | USAF US Air Force MARS [USB] |
| 27.765 | IF Base or mobile (secondary to government communications) |
| 27.780 | USA US Army MARS [USB] |
| 27.790 | USA US Army MARS [USB] |
| 27.810 | USA US Army MARS [USB] |
| 27.820 | USA US Army MARS [USB] |
| 27.829 | USAF US Air Force MARS [USB] |
| 27.860 | IF Base or mobile (secondary to government communications) |
| 27.870 | USAF ALE Channel Scope Command [USB] |
| 27.877 | USAF US Air Force MARS [USB] |
| 27.978 | USAF US Air Force MARS [USB] |
| 27.985 | USAF US Air Force MARS [USB] |
| 27.991 | USAF US Air Force MARS [USB] |
| 27.992 | USA US Army MARS [USB] |
| 28.000-29.700 | 10-meter Amateur Radio Band |
| 29.710 | IA Base or mobile |
| 29.730 | IA Base or mobile |
| 29.750 | IA Base or mobile |
| 29.770 | IA Base or mobile |
| 29.790 | IA Base or mobile |
| 29.800-29.890 | Fixed |
| 29.890-29.910 | Fixed/Mobile [Government] |
| 29.910-30.000 | Fixed (29.920-29.990 Aeronautical fixed) |

Baltimore-Washington International Update

Welcome aboard everyone! Our September column is loaded with new and updated frequencies for Baltimore-Washington International Airport (BWI) ATC facilities. We also have Airline Company frequencies for BWI and other airports in the area. Quite a few of these frequencies are in use in other parts of the country as well!

A big thank you to Mike Agner and Dave Schoenberger for the following frequencies. Visit their web page at www.resnet.wm.edu/~dtscho/scanning/airports/bwi.htm for updates on the frequencies and other interesting information.

Police:
453.9000 (123.0) Dispatch and Operations.
Fire:
154.1000 (123.0) Dispatch; 154.280 (CSQ)
Operations:
154.980 (123.0); 453.800 (123.0) Police Unofficial Secondary Channel/ other users.
Air Traffic Control:
115.000-ATIS; 128.800-ATIS*
118.050-Clearance Delivery
119.000-Approach (20-100 degrees); 228.400-Military
119.400/258.800-Tower
119.700-Approach (131.180 degrees); 231.600-Military
120.200-Ground Operations
121.900-Ground Control
122.050-UNICOM**
123.750-Tower TRSA; 254.500-Military
124.550-Approach (101-130 degrees); Also used for Departure; Military Departure is 325.800
125.525-Approach
126.750-Approach/Departure instructions; no aircraft replies.
128.700-Approach (181-190 degrees); also used for Departure; Military Departure is 307.900
133.750 Departure (Military frequency is 325.800); Approach/Departure instructions; no aircraft replies.
Aeronautical Radio Trunked Systems
Motorola Type I Trunked System;
Fleetmap for Trunktrackers: EIPS
856.8875; 857.8875; 858.8875; 859.8875; 860.8875
Talkgroup/User
600-14: Southwest Operations
600-15: Southwest - Skycaps/Wheelchairs
700-1; 700-2; 700-3; 700-6; 700-8; 700-9; 700-10; 700-11; 700-12; 700-13: US Airways Operations
*ATIS - Automated Terminal Information Service (continuous broadcast advising pilots of conditions at airport).
**UNICOM - "Unified Communications" (a common frequency for pilots)
Planespotting:
Go to the Observation Deck between Piers B and C.

Airline Companies Frequency List

Thanks to Mike Agner for permission to use this listing. The following people contributed to the list: Mike Agner; Tony Orr; Flo Baines; Tom Chambers; Ron Bruckman; Alan Henney; Jim Kilgallen; and many others.

"The VHF aircraft band list was made over the last six or so months (last update 03/03/99), detailing

ARINC (Aeronautical Radio Inc.) usage in and around BWI.

"You might ask why we said 'in and around'. With Regan National and Dulles so close to us in terms of plane distances, often these areas overlap. It is not uncommon for the three major airports to share a company frequency making it common for the area. Each airport with each company makes its own agreements with ARINC, so that rule may not always hold true."

Company Names and Callsigns (in quotes)

'Abex' - Airborne Express
'Air Shuttle' - Mesa Airlines
'Ameristar' - Ameristar Jet Charter
'Amtran' - American Trans Air = both a charter and scheduled airline
'Bizex' - Business Express Airlines
'Blue Ridge' - United Express (Atlantic Coast) @ IAD
'Bluestreak' - USAirway Express
'Cactus' - America West
'Carolina' - CCAir Incorporated
'Citrus' - Air Tran Airways
'Comair' - Delta Connection
'Connie Kalitta' - American International Airways
'Dynair Operations' - Used by Air Pakistan, Austrian Air and Aeroflot
'Eagle Flight' - American Airlines Commuter
(Note: Eagle Flight is Flagship Airlines when at BWI, per Flo Daines)
'Executive Jet' - bizjet operations?
'Emery' - Emery Air Freight
'Falcon' - Dassault Falcon Jet @ Teterboro and Richmond, VA
'Gulfstream' - Gulfstream Aerospace (biz jets)
'Guyair' - Guyana Airlines
'Johnson Controls' - Operates biz jets based at MKE (Milwaukee)
'Lifeguard' - Flight that carries human organs or patients (You may hear an airline flight identify itself as "United Lifeguard," for example.)
'Longhorn' - Express One Charter Services
'Manatee' - Air Tran Airways
'Midex' - Midway Express
'North American' - North American Airlines
'Phaser' - Skytrek
'Philip Morris Operations' - Philip Morris Corporation bizjet ops out of RIC or HPN
'Reach' - Air Mobility Command tac callsign (military); also civilian transports under USAF contract (*American Trans Air does a lot of these, jib*).
'Ryan' - Emery owns 727 freighters operated by Ryan International for US Postal Svc.
'Saudia' - Saudi Arabian Airlines
'Spiritwings' - Scheduled/Charter Outfit-Long Island Jet Center at ISP on 129.775 for ops.
'Speedbird' - British Airways
'Skyservice' - based in Toronto, Canada
'Stinger' - Eastwind
'Sun Pacific' - Sun Pacific International
'Tee Air' - Tower Air Incorporated
'Tradewinds' - Tradewinds Airlines (??)
'Waterski' - TWA Express = Trans States Airlines. *Operate express flights for TWA and USAir (per Flo Daines).*
128.850 - American Trans Air; Citrus; Airtran (PHL)
128.875 - Helicopters air-air (!!); 'Waterbug'
128.900 - USAirways Ramp Services
128.925 - Biscayne; Great Lakes
128.950 - 'Skyservice'
128.975 - Northwest

129.000 - Signature Flight Support at BWI and DCA (Regan Washington Nat'l Airport)
129.025 - Executive Jet
129.050 - American
129.075 - Dixie; 'Citrus'
129.100 - TWA; 'Citrus'
129.150 - Air Jamaica; Piedmont; 'Speedbird'; 'Connie Kalitta'
129.175 - Blue Streak
129.200 - Federal Express; Midway; Midway Express
129.225 - American; Midway Express; 'Eagle Flight'; 'Corflex'
129.250 - Frontier Air; Continental
129.275 - ITS; Northwest
129.300 - United; 'Blue Ridge' (A United Commuter); Air Ontario; Air Canada; 'Comair'; 'Citrus'; 'Manatee'; 'Hanover'; Blue Streak
129.325 - American; Midway; 'Blue Ridge'
129.350 - World Airways; 'Connie Kalitta'; 'Ryan'; 'Emery'; 'Citrus'; TWA; Tower Air
129.375 - 'Connie Kalitta'
129.400 - Emery Air Freight; World Airways; Tower Air; Britannia
129.425 - 'Abex'; 'Ryan'; 'Emery'; UPS; American; 'AmTran'
129.450 - 'Connie Kalitta'; 'Citrus'; Tower Air; 'Blue Ridge'; Tower Air; Continental; 'Ryan'; 'Emery'; Midway Express
129.475 - Continental
129.500 - Delta Radio; 'Comair'; Kiwi
129.525 - Frontier Air
129.550 - 'Blue Ridge'; United; 'Stinger'; American; Delta
129.575 - Regional
129.600 - Delta Radio; USAirways; Link Jet; 'Phaser'
129.625 - Evergreen; Frontier
129.650 - Delta; Avianca; Continental; Mexicana; Kennedy Ramp; 'Amtran'; 'ComAir'; Aeromexico
129.675 - Delta; La Guardia Ramp
129.700 - Signature
129.725 - 'Air Shuttle'; 'Wings Express'; Rouse; International
129.750 - Piedmont; Allegheny; 'Blue Streak'; 'Air Shuttle'
129.775 - Hawthorne Aviation @ IAD (Dulles); 'Waterski'; 'Carolina Air Transport'; Dulles Ramp Ops; Montgomery Aviation
129.800 - USAirways; Allegheny; Piedmont; TWA; Richmond Ramp; 'Blue Streak'; 'Lifeguard'
129.825 - Prittsburg Ramp, USAir; 'Johnson Controls'
129.850 - American
129.875 - Midway
129.900 - American; Continental
129.925 - Continental; Delta; Cactus
129.950 - Allegheny; 'Philip Morris Operations'; Corporate Air
129.975 - Lockheed Martin; Delta
130.000 - Allegheny
130.050 - 'Blue Ridge'
130.075 - 'Waterski'; Piedmont; 'Blue Ridge'; Kennedy Ops; 'Longhorn'
130.100 - USAirways; Piedmont
130.125 - Air France; Virgin Atlantic
130.150 - Signature @ Teterboro; Speedbird @ PHL; 'Winair'; Westwind
130.175 - Midway
130.200 - TWA; American; United; San Francisco ARINC
130.225 - TWA; 'Stinger'
130.250 - United Express/Atlantic Coast Airlines Maintenance Control @ IAD Continental
130.275 - Frederick Aviation; Air Charter
130.300 - Northwest
130.325 - Eastwind, TWA
130.350 - Northwest
130.375 - United Maintenance @ IAD; British Airways @ CLT; 'Air Tran'; TWA
130.400 - Continental; USAirways; Atlantic Aviation; 'Executive Jet'; 'Cactus'
130.425 - San Francisco ARINC; Ryan-Emery
130.475 - Southwest; Air Canada, BWI Ramp Ops; Allegheny

130.500 - USAirways; Allegheny
130.525 - Continental; 'Cactus'; Gulfstream; Midwest Express; American; Ontario; Jetlink
130.575 - USAirways, BWI Ramp; Hawthorne; Piedmont; Waterski; TWA
130.600 - 'First Aviation' Teterboro, 'Executive Jet'
130.625 - TWA
130.650 - 'Reach'
130.675 - 'Tee Air'; Northwest
130.700 - 'Blue Ridge' @ IAD; Delta
130.725 - TWA
130.750 - American
130.800 - Air Jamaica // 129.150; Piedmont; TWA, ORF; 'Waterski'; USAirways
130.825 - Allegheny; Continental
130.850 - Mexicana; 'Ameristar'; 'Cactus'; Signature FBO (Fixed Base Operations) Newark; Sun Pacific
130.875 - Air Canada; 'Carolina'
130.900 - 'Comair'; Delta
130.925 - Allegheny; USAirways; Piedmont; 'Air Shuttle'
130.950 - 'Eagle Flight'; Bizex
130.975 - Continental
131.000 - USAirways
131.025 - Comair Operations, CHO; Continental
131.050 - TWA; Midway; Blue Ridge
131.075 - United Load and Planning @ IAD; Air Canada; (Also @ IAD)
131.100 - 'Connie Kalitta'; Allegheny; Aviatat (FB)
131.125 - American
131.150 - Piedmont
131.175 - TWA
131.200 - Continental; Iberia
131.225 - Continental
131.250 - Northwest
131.275 - Kiwi; Federal Express; 'Midex' (Midway Express)
131.300 - Blue Ridge; Pakistani Air to JFK; Alitalia; 'Connie Kalitta'; United
131.325 - 'Stinger'
131.350 - Delta, 'DC'
131.375 - United Ramp Control @ IAD; Air Canada
131.400 - Saudi Air making calls to Washington and JFK
131.425 - 'Falcon'; Spiritwings; 'Amtran'; Jet Aviation; Executive
131.450 - Delta
131.475 - Piedmont
131.500 - Continental; Aruba; 'Ameristar'; Cactus
131.525 - Air Jamaica // 129.150; World Airways; Biscayne; Million Air FBO
131.525 - Lufthansa
131.600 - TWA; Airtran, PHL
131.625 - DHL calling PHL Ops; 'Connie Kalitta'
131.650 - USAir; Metrojet
131.675 - Colgan Air
131.700 - 'Blue Ridge'; Amtran
131.750 - Eastwind; 'North American'
131.775 - United Express, Dulles Ramp; 'Blue Ridge'
131.800 - US Airways; Allegheny; Piedmont; 'Air Shuttle'
131.825 - Federal Express
131.850 - Delta; 'Comair'
131.875 - Signature FBO @ BDL, Dulles; Air Tansat (Montreal-Mirabel and Toronto)
131.900 - Delta (Atlanta Radio)
131.925 - Federal Express; Kiwi, Ryan
131.950 - 'Spiritwings'; 'Guyair'; Dynair Operations; 'Tradewinds'
131.975 - 'Dynair' Operations; Saudia; 'Spanair'
132.000 - Atlantic Aviation, Teterboro; Leesburg UNICOM; Signature FBO @ White Plains NY
136.500 - 'Blue Ridge'
136.525 - Emery
136.550 - 'Blue Streak'

I have monitored most of these frequencies and they are in use to date by the airlines listed with them. 73 and out.

Eglin Air Force Base

One of the major bases located here in the southeast United States, Eglin AFB, also has a large trunk system to support base tenants.

Eglin Air Force Base belongs to the Air Force Materiel Command, and the Air Armament Center is the host unit. More than 45 associate units call Eglin home. The base's rich 60 year history carries a fine tradition of excellence, both in the Air Force and in partnership with the local communities. Eglin is one of the largest Air Force bases in the world, covering 724 square miles of reservation and 97,963 square miles of water ranges in the Gulf of Mexico. Eglin employs more than 8,500 military and approximately 4,500 civilians.

Recently *MT* regular reporter, Brian "The Scanner Dude" Cathcart, spent a day at Fort Walton Beach, and mapped out the UHF trunk system at Eglin.

Thanks to Brian's efforts, we now have a much clearer picture of this massive Motorola AMSS trunk system.

Eglin Air Force Base UHF trunked system (Fort Walton Beach, Florida)

Eglin AFB is equipped with a Motorola AMSS trunked radio system which operates on a frequency allocation consisting of eight repeater channels which are in the UHF 406-420 MHz range. The Eglin system is designed to support the training exercises of the Army's 6th Ranger Training Brigade. This project was completed on 26 June 1997.

Motorola Type 2 AMSS, System ID = 251F, 4 sites, analog and DES encryption used.

Site 1: Base = 406.350 MHz, Offset = 25-kHz
Frequencies: 406.750, 407.550, 408.050, 409.950

Site 2: Base = 406.350 MHz, Offset = 25-kHz
Frequencies: 406.350, 407.150, 407.950

Site 3: Base = 406.000 MHz, Offset = 25-kHz
Frequencies: 407.550, 407.600, 408.050, 408.100, 408.650, 409.025, 409.225, 409.300, 409.350, 409.650, 409.900, 410.200

Site 4: Base = 406.000 MHz, Offset = 25-kHz
Frequencies: 406.950, 407.150, 407.375, 407.950, 408.175, 408.750, 409.125, 409.375, 409.425, 409.775, 411.550, 412.975, 413.425

Brian points out that 407.150 and 407.950 MHz are used at both site 2 and 4. At first, he thought this was a mistake, but his Uniden BC-245XLT tracks both systems perfectly with all parts of all conversations heard. Plus when you use the frequency display function on both sites, these two frequencies come up active.

Based on some rough notes I made from my last trip down to western Florida, there might be one or two more additional trunking sites

associated with this AMSS trunk system. One of those additional sites has been tentatively assigned to Hurlburt Field.

Thanks a million, Brian, for clearing up one of the more extensive government trunking systems in the country. Now does anyone have any talk group IDs?

U.S. Army Trunked Systems

Back in our January 2000 *Milcom* column we passed along an extensive list of U.S. Air Force base trunking systems. This month we will visit U.S. Army bases with trunking systems.

Aberdeen Proving Ground, Maryland (Motorola Type II Astro SmartZone)

Aberdeen PG was designed as a multi-site, wideband, 12 channel UHF, Astro digital/analog trunked system. This system is capable of supporting over 3500 users.

Aberdeen Site: 406.350, 406.700, 407.275, 407.475, 408.550, 409.025

Edgewood Site: 406.225, 407.250, 409.500, 410.150

Other possible trunk frequencies: 407.350, 407.550, 408.775, 408.800, 409.925, 409.950, 411.500, 412.900, 412.975, 413.225, 413.475, 415.425, 416.100, 416.650, 416.950, 417.950, 419.825

Anniston Army Depot, Alabama

(Motorola Type II Astro SmartZone, five channels)

Anniston Army Depot is a three site system located in Alabama, with two sites located on Anniston and the third located on Fort McClellan. Anniston is equipped with a Motorola Astro SmartZone trunking system. This system is capable of supporting over 500 users. No frequency/talk group information is currently available on this system.

Camp Frank D. Merrill, Georgia

(Ericsson EDACS) [Dahlongega]

Site 1 Brawley Mountain: LCN 1-407.250 LCN 2- 407.375 LCN 3- 407.575 CW ID-"Brawley"
Site 2 Black Mountain: LCN 1-407.225 LCN 2-407.525 LCN 3- 408.050

Camp Gruber, Oklahoma (Type System Unknown)

Frequencies: 406.550, 407.350, 408.150, 408.950, 409.750, 415.350, 416.150, 416.950, 417.750, 418.550

Camp Shelby, Mississippi (Motorola Type II Astro SmartZone, 13 channels)

Camp Shelby consists of a multi-site Astro SmartZone digital UHF narrowband trunking system which has thirteen channels. The system installation was completed May 1997.

No frequency/talk group information is currently available on this system.

Defense Supply Center, Richmond, Virginia

(Motorola Type II SmartNet)

DSC Richmond is a single site with the SmartNet II+ trunking system. It has three channels within specified subscriber units. As host of a SmartZone controller, Richmond will also provide service to the Navy at Norfolk, VA, and to Fort Lee, VA. Richmond is in the process of upgrading to the SmartZone system. The initial project was completed on June 26, 1997.

Base=406.000 MHz, Offset=25 kHz

Frequencies: 409.550, 407.325, 406.950

Edgewood Arsenal, Maryland

See Aberdeen Proving Ground trunk system above

Fort A.P. Hill, Virginia

(Motorola Type II SmartNet-VHF high band trunk system)

Fort AP Hill is a single site with a SmartNet II+ four channel trunking system. The system is designed to provide trunked RF communication in the VHF 132-154 MHz frequency range.

Frequencies: 141.200, 142.475, 142.925, 143.325, 143.400

Fort Belvoir, Virginia

(Motorola Type II)

System ID=2C36, Base=406.200 MHz, Offset=25 kHz

Frequencies: 406.200, 406.300, 406.525, 406.775, 407.025, 408.850, 409.250, 411.200

Fort Benning, Georgia

(Ericsson EDACS 400 MHz Trunked System)

Frequencies: 406.550, 406.750, 407.350, 408.150, 408.950, 409.050, 409.750, 415.350, 415.550, 416.150, 416.950, 417.150, 417.750, 418.550

Fort Bliss, Texas

(Type System Unknown, 10 channels)

No frequency/talk group information is currently available on this system.

Fort Bragg, North Carolina

(Motorola Type II Astro SmartZone, 28 channels)

Fort Bragg consists of a multi-site SmartZone digital narrowband trunking system which is designed to service both Fort Bragg and Pope AFB. This system supports the Project 25 Common Air Interface (CAI). No frequency/talk group information is currently available on this system.

Fort Campbell, Kentucky

(Motorola Type II Astro SmartZone)

Fort Campbell consists of a multi-site securnet SmartZone 2.0.3 system analog wideband trunking system. This system will support both type I and digital encryption standards. Currently, Fort Campbell is in the process of an engineering redesign of the system to convert it to a digital, narrowband compliant system

System ID=2309, Base=406.000 MHz, Offset=25 kHz.

This is a two site system with phone patch capability.

Site 1: 406.750, 407.150, 407.950, 408.350, 409.550

Site 2: 406.350, 408.750, 408.950, 409.150, 409.950

Fort Carson, Colorado

(Motorola Type II Astro SmartZone)

Fort Carson consists of a multi-site Astro SmartZone digital narrowband trunking system.

Frequencies: 407.050, 408.150, 408.750. There are other as of yet unidentified frequencies associated with this system.

Fort Chaffee, Arkansas

(Motorola Type II Astro SmartZone)

The Fort Chaffee site requires three separate communication sites which consist of size "A" systems. These separate systems support the requirements of a narrowband SmartZone system with secure voice operation, along with a one position communications console and system management network. The sites are linked through a government furnished T1 phone line/fiber network or microwave sub-system.

Frequencies: 406.350, 406.950, 407.150, 407.350, 407.950, 408.150, 408.550, 408.750, 408.950, 409.150, 409.350, 409.550, 409.750, 410.150, 414.750, 415.150, 415.950, 416.150, 416.350, 416.550, 416.750, 416.950, 417.150, 417.550, 417.750, 417.950, 418.350, 418.550

Fort Detrick, Maryland

(Motorola, 5 channels)

Frequencies: 406.550, 407.075, 408.550, 409.150, 409.750

Fort Dix Army Garrison, New Jersey

See McGuire AFB listing in January 2000 *Milcom* column

Other possible frequencies to watch for: 408.225, 408.750, 409.425, 412.475, 413.650, 416.750, 417.125, 417.750, 418.875, 419.350

Fort Greely, Alaska

(Ericsson EDACS, 5 channels)

Known Frequencies: 407.225, 407.250, 407.275, 407.300

Fort Huachuca, Arizona

(Motorola Type II Astro SmartNet+)

Fort Huachuca is equipped with a Motorola SmartNet II+ Astro trunked radio system and a Motorola Centracom Gold Classic control console. The system is designed to provide narrowband, digital, RF communication in and around the Arizona post. This project was completed on January 16, 1997.

System ID=5F1C, Base=406.000, Offset=25 kHz

Frequencies: 406.950, 407.150, 407.550, 407.950, 408.150, 408.350, 408.750, 409.150

Fort Irwin, National Training Center, California

(Ericsson EDACS, 25 channels)

Frequencies: 406.650, 406.850, 406.950, 407.075, 407.625, 407.950, 407.975, 408.025, 408.550, 409.550, 409.750

Fort Lee, Virginia

This base had plans to operate a trunking system but they have since been cancelled.

Fort Lewis, Washington

(Motorola Type II SmartNet)

Fort Lewis is in the process of a two and four channel expansion of the existing six channel SmartNet trunked radio system.

Frequencies: 406.950, 407.250, 408.550, 409.150, 409.350, 410.150

Fort McCoy, Wisconsin

(Motorola Type II Astro Smart Net)

Fort McCoy is planning a single site, SmartNet ASTRO, seven channel, digital, narrowband trunked system, with six console positions.

The initial design has been completed, and alternatives to accomplish the site preparation are being evaluated. The system will support over 500 users. No frequency/talk group information is currently available on this system.

Fort Meade, Maryland

(Motorola Type II Astro)

Fort Meade is a size "C" two site, five channel, Astro digital trunked system, with nine console positions. The system supports over 750 users.

System ID=6B03, Base=406.000 MHz, Offset=25 kHz

Frequencies: 406.325, 407.400, 407.575, 409.450

Fort Monmouth, New Jersey

(Motorola System)

This is the government's point of contract for the Motorola BSTRS trunking contract, But at the present we have no frequency/talk group information available on this system.

Fort Polk, Joint Readiness Center, Louisiana

(Ericsson EDACS, multi-site, 39 channels)

Site 1- Cemetery 13: 406.350, 406.750, 407.150, 407.375, 407.475, 407.950, 408.150, 408.475, 408.575, 408.750, 408.950, 409.150, 409.325, 409.550, 409.750, 409.950,

Site 2- Mill Creek: 406.350, 406.550, 406.750, 407.150, 407.350, 407.450, 407.950, 408.050, 408.150, 408.550, 408.750, 408.950, 409.150, 409.550, 409.750, 409.950,

Site 3- Peason Ridge: 407.175, 407.325, 407.425, 407.525, 408.025, 408.175, 408.425, 408.525, 408.625, 409.025, 409.125, 409.225, 409.300, 409.350, 409.475, 409.600, 409.850, 410.000

Fort Richardson, Alaska

(Ericsson EDACS, 10 channels)

See Elmendorf AFB listing in January 2000 *Milcom* column

Fort Sam Houston, Texas

(Motorola AMSS SmartNet, 3 sites-25 channels)

If any of our readers in San Antonio have more details on this citywide, multi-base/service AMSS system, we would like to hear from you at larry@grove-ent.com. Additional frequencies are listed with the various San Antonio air force bases in the January 2000 *Milcom* column.

Frequencies: 406.350, 407.150, 407.950, 408.750, 409.550, 415.150, 415.950, 416.750, 417.550, 418.350

Fort Stewart, Georgia

(Motorola Type II Astro SmartZone)

Fort Stewart hosts an Astro SmartZone trunked radio system with 22 narrowband repeater channels. There are two fixed sites, Diamond School and DCO Building, plus four expansion sites at DPW, TAC-X, Morgans Bridge, and Taylors Creek. No frequency/talk group information is currently available on this system.

Fort Shafter, Oahu Island, Hawaii

(Motorola, 20 channels)

No frequency/talk group information is currently available on this system.

Fort Wainwright, Alaska

(Ericsson EDACS)

Frequencies: 406.350, 407.150, 407.950, 408.350, 408.750, 408.950, 409.150, 409.550, 409.750, 410.200

Pine Bluff Arsenal, Arkansas

(Motorola, 5 channels)

Possible frequencies: 407.225 407.275 407.400 407.500 407.575 412.850 414.725 416.425 417.650 419.150

Sierra Army Depot, California

(Type System Unknown)

Frequencies: 163.000/150.425, 164.700/150.550, 168.000/150.600, 169.600/150.625, 171.975/150.725

Tooele Army Depot, Utah

(Motorola, 5 channels)

Frequencies: 406.350/415.150, 407.150/415.950, 407.950/416.750, 408.750/417.550, 409.550/418.350

Walter Reed Army Medical Center, Washington, DC

(Motorola Type II SmartNet)

Walter Reed consists of a single unit which is able to support over 300 users. Equipped with a Motorola SmartNet trunking system, Walter Reed has had an engineering design effort, size "B" and small design and analysis effort. The Radiax Antenna System that was installed with the system, will enable WRAMC to access the government owned SECONET trunking system. No frequency/talk group information is currently available on this system.

White Sands Missile Range, New Mexico

(Motorola, 45 channels)

No frequency/talk group information is currently available on this system.

Yuma Proving Ground, Arizona

(Type System Unknown)

Frequencies: 407.150, 407.950, 408.750

VHF Low Band Skip is Back

Now that we are moving into the cooler months of the year, low band skip enthusiast should start seeing long haul activity pickup. In fact, within a very few weeks of you receiving this issue of *MT*, east-west paths should be dominating the frequencies in scanner shacks. Ian Julian in Hamilton, New Zealand, and the VHF Skip news group posted the military low band frequencies shown in table one some time ago, and this could help identify some of the traffic you will be hearing very soon from your speakers.

If you have an update on a military trunking system, we want to hear from you. So set up those new second generation trunk trackers to search the 406-420 MHz spectrum and let us know what you are hearing. Until next time, 73 and good hunting.

Table 1: September Column Glossary

| | |
|-------|--|
| AFB | Air Force Base |
| AMSS | Automatic Multiple Site Switching |
| BSTRS | Base Support Trunked Radio System |
| DES | Data Encryption Standard |
| EDACS | Enhanced Digital Access Communication System |
| ID | Identification |
| kHz | Kilohertz |
| LCN | Logic Channel Number |
| MHz | Megahertz |
| MoD | Ministry of Defense |
| RAF | Royal Air Force |
| RNAS | Royal Navy Air Station |
| USAFE | United States Air Force Europe |

It's Back...

Over the last few years, AM DXers have had several fantastic opportunities to DX relatively open channels as the CBC takes their 50,000 watt powerhouse AM stations off the air and moves them to FM. Of course, no good thing lasts forever and many of these ex-CBC frequencies are eventually reactivated under new ownership. Eastern listeners have been enjoying the absence of Toronto's CBL-740 for quite some time, but by the time you read this the 740 frequency will probably be active again.

In late June, the Canadian government granted three new stations in Toronto. The CBC's old frequency of 740 kHz will go to the owners of CHWO-1250, who will carry a nostalgia/easy listening format. CHWO will switch to a contemporary Christian format, and their third station CJMR-1320 will drop the religious music and become a fully ethnic station.

The other two new Toronto stations will be relatively low-power FM outlets – they will be difficult (but not impossible!) to DX, but will unfortunately further crowd the dial for the numerous FM DXers in Canada's largest city. A new station on 93.5 with 300 watts will air an urban format, while one on 106.5 with 250 watts will be operated by Native Americans. I do sus-

pect (but don't know for sure) that both stations will transmit from the CN Tower or another elevated location, and will have better coverage than their low power suggests.

Some other Canadian changes are likely to affect West Coast DXers. Two stations in the vicinity of Victoria, B.C. – CKXM-1200 and CKAY-1500 – are moving to FM. (In fact, CKXM is already gone from the AM dial.) CKXM's AM frequency is likely to be taken over by the CBC for a relay of their French-language FM station in Vancouver. I'm sure a French-language station will really stand out on 1200 kHz in the West! A third Victoria station, CJVI-900, also requested a move to FM but was denied. They are now trying again, attempting to swap frequencies with college station CKMO-103.1. CKMO's programming will also stand out if the move to 900 kHz is granted.

❖ Bits and Pieces

The first Low-Power FM (LPFM) filing window has closed, and the FCC has released a list of applicants. (www.fcc.gov/Bureaus/Mass_Media/Public_Notices/Brdest_Applications/ap000621.txt, which is a 89 kB file and will take awhile to download) Over 700 applications appear in this file, many of them mutually-exclusive. Eighteen different organizations requested 105.9 MHz in San Diego or suburbs.

A few of the applications don't appear to be acceptable according to the LPFM regulations. For example, applications appear for 93.7 and 97.9 in San Francisco. Both are too close to existing stations on 93.3 and 98.1 in that city. All these applications may still be moot, as the law that would rescind the LPFM service has not yet seen final action. Reports are that President Clinton will veto it, but it may have a large enough majority in Congress that a veto could be overridden.

There's always a big risk in mentioning Internet sites in a column that takes a few weeks to be printed and distributed. The Internet changes quickly, and the site may be gone by the time the readers see the address in print. Unfortunately, that happened with the MW Data-

base Viewer site I mentioned in May, and I definitely heard about it! If you looked for this program (www.home.earthlink.net/~nsadams), try again. The site has reappeared. You might also want to take a look at another program on www.csvhfs.org; look under Software Downloads for AMSTNS.

DXers always need to be wary; a DX logging isn't always what it seems to be. In late June, Nashville TV DXer Tom Bryant and myself both noted a strong sporadic-E TV signal on channel 3 carrying a NY Yankees-Chicago White Sox baseball game from Fox. The problem is, there is no Fox affiliate on channel 3! Luckily, at one point the mystery station's audio faded up. We heard the Fox audio weakly in the background – overridden by two Spanish-language announcers calling the game. A Mexican station was using the Fox feed...

The nights are getting longer; it's time to make sure your antennas are ready for the winter DX. Let us know what you're hearing. Write: Box 98, Brasstown NC 28902-0098, or by email to w9wi@bellsouth.net. Good DX!

LPFM in Atlanta

The following applications for new low-power FM stations in the Atlanta area were filed in June. Over 700 applications in twelve states were filed in the first window.

- 90.5: Richard A. Adams, Cumming
- 92.3: The Logos Vietnamese Ministries
- 93.5: Alpharetta Educational Radio Service; Bill Tullis; Atlanta & Omar Mosques, Norcross; Little Group Media, Norcross
- 97.7: Duluth Christian Radio
- 97.9: North Point Ministries, Alpharetta; Crusade Christian Faith Center, Conyers; Northlake Baptist Church, Cumming; Gospel Radio Media, Decatur; Gwinnett Public Radio, Lilburn; Calvary Chapel Stone Mountain, Lilburn; Noon-day Baptist Church, Marietta; Roswell High School; New Millennium Broadcasting, Roswell; Caribbean Community Organization, Stone Mountain; Cherokee Presbyterian Church, Woodstock
- 99.1: Mountain Park Educational Radio, Alpharetta; Northside Public Radio, Roswell
- 99.9: Our Lady of the Americas Catholic Mission, Doraville
- 100.3: Alvin XEX Inc.; Episcopal Media Center, Inc.
- 100.5: Georgia Department of Transportation; Warith Deen Mohammed High School
- 100.9: Association of Missionary Evangelists, Conyers
- 101.3: Georgia Department of Transportation
- 106.3: Fellowship of Holy Hip Hop, Inc.
- 106.7: Georgia Department of Transportation, West Point

Federal Communications Commission
Washington, D.C. 20554

Approved by OMB
3064-0920

FCC 318

**APPLICATION FOR CONSTRUCTION PERMIT
FOR A LOW POWER FM BROADCAST STATION**

FOR FCC USE ONLY

FOR COMMISSION USE ONLY
FILE NO.

Section 1 - General Information

1. Legal Name of the Applicant

Mailing Address

City

State or Country (if foreign address)

ZIP Code

Telephone Number (include area code)

E-Mail Address (if available)

Call Sign

Facility ID Number

2. Contact Representative (if other than applicant)

Firm or Company Name

Telephone Number (include area code)

E-Mail Address (if available)

3. Application Purpose.

☐ New station

☐ Major modification of construction permit

☐ Major change in licensed facility

☐ Minor modification of construction permit

☐ Minor change in licensed facility

☐ Amendment to pending application

a. File number of original construction permit: _____ ☐ N/A

b. Station location: _____

City

State

If an amendment, submit as an Exhibit a listing by section and question number of the portions of the pending application that are being revised.

Exhibit No. _____

FCC 318
March 2000

Over 700 copies of FCC Form 318 were filed by low-power FM applicants in the first filing window.

Current Pirate Radio Programming

Now that summer is ending, winter propagation and the DX season is arriving. North American pirate broadcasting flooded the airwaves during the summer despite high static levels and the current sunspot peak, but conditions will now be at their best during the fall for shortwave pirate reception. If you scan across the pirate band around 6955 kHz, what are you likely to hear? Recent loggings from numerous *MT* readers show that interest in pirate DXing remains at a high level. You won't find programming like this anywhere else on the shortwave bands, or on commercial broadcasters in your area either.

Blind Faith Radio- They consistently play classic rock music, but their general theme varies around holidays. (Merlin)

Eat It Radio- Captain Wiener came out of the woodwork during the summer. His rock format is presumably evolving. (None, asks for log reports via *The ACE*, *Free Radio Weekly*, and the Free Radio Network at the URL below).

Indira Calling- Many pirates use parody in their productions. Vijay Nehru's jabs are at All India Radio. You won't hear his stuff on the real Indian broadcaster. (Providence)

KIPM- Eclectic fare of rock music, clandestine relays, and drama are common on this one. (Lula)

KMUD- A few stations appear to transmit from the West Coast. So, the pop music here is a good target out west. Their unusual IDs sometimes are in Morse code. (Lone Pine)

KRMI- Despite the call letters, it's not a parody of licensed station WRMI; Their rock and novelty music uses a slogan of "Radio Michigan International." (still no maildrop)

Radio Azteca- Bram Stoker is the leading comic in pirate radio today. His originally produced humor is entirely focused on DXers and broadcasters, where nobody is safe from Bram's witty jabs. (Belfast)

Radio Free Euphoria- Captain Ganja's marijuana advocacy pirate is now sometimes relayed via IRRS-Milan on 7120 kHz. The logs we received noted this around 0830 UTC, which is not exactly prime time. (Belfast)

Radio Free Speech- Bill O. Rights has been making "final broadcasts" for a couple of years now. His specialty is an off-key parody of Francis Scott Key's national anthem at sign-off. (Belfast)

Radio Garbanzo- Fearless Fred is a naturally funny guy. His side-splitting rough humor is a real treat on the pirate bands. (Belfast)

Radio Nonsense- The operator of this station has been deceased for a number of years, but

rebroadcasts of his fare have surfaced recently. (None)

Radio USA- Mr. Blue Sky has been around since 1983 with punk rock, comedy, and pirate commentary. (Belfast)

Sycko Radio- They came out of nowhere to be one of the most active pirates of the summer. The phonetic spelling of the ID is "Psycho Radio," but they announce this spelling over the air. Their programming is evolving; keep your eyes on this one. (They promise a future address, but it wasn't available at press time)

Voice of Captain Ron Shortwave- Captain Ron blends rock music with commentary on the pirate radio scene. Occasionally he coordinates broadcasts with people logging into the Free Radio Network chat room at <http://www.frn.net> on the internet. (uses captainronswr@yahoo.com e-mail)

WACK- Among all of the pirates, their rock music sounds closest to a slick commercial radio production. (announces 800 toll-free number over the air)



WBCQ- Many reports of a WBCQ parody have surfaced, airing in late June on 7415 kHz after the licensed station signed off. The station generated solid signals, focusing speculation on **Radio Metallica Worldwide**, but this has not been confirmed by *MT*.

WHYP- The James Brownyard memorial station pokes fun at a local broadcasting legend from North East, PA. James usually reads temperatures for Lake Erie cities, which remain the same regardless of the season. (uses whyp1530@yahoo.com e-mail)

WLIS- Charles Poltz won the NASWA pirate popularity poll this year. His long-standing format plays genuine interval signal themes from licensed shortwave broadcasters as though they were hit tunes. (Blue Ridge Summit)

WMFQ- At first, this one sounds like a standard rock music pirate. But, all IDs consist of a chanting bunch of guys who promote QSLs with a profane slogan. (Providence)

WRX- Jimmy the Weasel, everybody's favorite pirate, uses intentionally caustic phrases to entertain. (Milton)

❖ Joop ter Zee Passes Away

We have the sad news to report that Joop ter Zee, well known Europirate radio personality and author, passed away on June 28 following complications from hepatitis. He was the co-founder of the FRS-Holland, a significant producer of Europirate programming and the sponsoring organization for the *FRS-Goes DX* bulletin. Joop ter Zee's "Alternative Thoughts" column in the FRS bulletin and a number of shows on the FRS-Holland pirate stations. His last show, a test to North America on 19 meters, was transmitted this spring, ending nearly twenty years of European pirate broadcasting and journalism. Condolences may be sent via the Herten maildrop listed below.

❖ Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign addresses. Send your letters to PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 24, Lula, GA 30554; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 928, Lone Pine, CA 93545; PO Box 29, Milton, ME 04294; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 2727, 6049 ZG Herten, The Netherlands.

❖ Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via my new e-mail address atop the column. This month's contributors include John T. Arthur, Belfast, NY; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Bill Finn, Philadelphia, PA; Ullis Fleming, Glen Burnie, MD; Harold Frodge, Midland, MI; Raul Gonzalez, Santiago, Chile; Sheldon Harvey, Montreal, Quebec; William T. Hassig, Mt. Prospect, IL; Hans-Joachim Koch, Niddatal, Germany; Chris Lobdell, Stoneham, MA; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Big Mike, Belfast, NY; Mike Prindle, New Suffolk, NY; Lee Silvi, Mentor, OH; Bud Stacey, Setsuma, AL; Peter Verbruggen, Netherlands; Enrique Alejandro Wernbagher, Buenos Aires, Argentina; Niel Wolfish, Toronto, Ontario; and Andrew Yoder, Mt. Alto, PA.

Longwave – Many Hobbies in One

The lowest frequency most people will ever tune to is 530 kHz on their car's AM radio dial. Even within the radio hobby, there is little understanding of what goes on below the AM broadcast band. The uninitiated sometimes write the longwaves off as being "noisy" or a place where only a few beacons can be heard.

In truth, longwave provides some of the most varied reception in the radio spectrum. An array of signals can be heard, including voice, RTTY, Morse Code and even mysterious signals created by the Earth itself. This month we'll explore many of these activities and hopefully inspire you to tune in!

❖ Beacons

Let's start with the obvious. Since the 1920s navigation beacons have populated the longwaves, and they are still a prominent tenant. These unmanned stations repeatedly send their ID in Morse Code, allowing navigators to home in on their signals and reach their destinations safely.

For radio hobbyists, beacons are important for another reason. They provide fixed signals with a constant power output and an omnidirectional radiation pattern. By consulting a beacon directory such as the *BeaconFinder* (P.O. Box 56, W. Bloomfield, NY 14585) the exact location of a beacon can be determined from its ID.

The real fun of beacon chasing comes not from the content of their signals, but from the *fact* of reception. You see, the majority of these signals originate from small shacks sitting out in the middle of a field with transmitters that frequently produce no more than 25 watts. They are not meant to be heard at distances much beyond 100 miles, so it is a thrill when they can be heard at ten times this distance.

| MORSE CODE | | |
|------------|---------|-----------|
| A •— | N —• | 1 •— — — |
| B —••• | O — — — | 2 •• — — |
| C —• —• | P •—•• | 3 • — — — |
| D —• — | Q —• —• | 4 ••• — |
| E • — — | R • —• | 5 •••• |
| F •••• | S •• — | 6 —••• |
| G — —• | T — — — | 7 — —•• |
| H •••• | U •• — | 8 — — —• |
| I •• — — | V •• —• | 9 — — —• |
| J • — — — | W • — — | 0 — — — — |
| K —• — | X —• —• | |
| L • —•• | Y —• —• | |
| M — — — | Z —••• | |

Figure 1. A chart such as this can be used to decode the ID of a longwave beacon.

"Collecting" beacons has become a popular sport. Participants keep detailed lists of their intercepts and sometimes collect QSL cards from the Engineers-in-Charge of these stations. Several *MT* readers have logged 600 beacons or more – some from over 3,000 miles away.

Can't copy Morse Mode? Don't worry. The speed of most beacons is so slow that you can jot down the dots and dashes and look them up on a Morse Chart (see Figure 1).

❖ NAVTEX

At 518 kHz, you'll most likely hear the "diddle-diddle" sounds of the Coast Guard's NAVTEX system. These signals contain information of interest to mariners such as weather warnings, overdue vessels, military exercises and the status of aids to navigation.

All you need to display NAVTEX is a stable receiver with a BFO and a demodulator that can handle AMTOR or SITOR Mode B. (Most hobby-grade decoders are capable of Mode B reception.) For a complete discussion of NAVTEX including station schedules, refer to the August 2000 issue of *Below 500 kHz*.

❖ Broadcasters

In Europe, longwave is commonly used for domestic broadcast in addition to the mediumwave AM band. When conditions are right, it is possible to hear these stations in North America. The key is to listen at times when there is a complete path of darkness between you and the transmitting station. For East Coast listeners, prime-time is from local dusk to about 1 a.m.

Some kingpins to try for are: BBC/198 kHz, Atlantic 252 (Ireland)/252 kHz, Allouis, Fr./162 kHz, Saarlouis, Germany/183 kHz and Iceland/189 kHz. You might hear anything from a tennis match to top-40 music programs on these stations, but don't expect "pipeline" receiving conditions. Typically, the winter months provide the best reception.

❖ Military Stations

From 150 kHz on down, things begin to change. At these frequencies, day vs. night reception becomes less of a factor, and signals are commonly heard around the clock. For this reason, the military has chosen VLF for many of its key stations.

While their transmissions usually consist of heavily-encrypted data, you can often determine a station's identity by consulting a frequency guide (see the *BeaconFinder* mentioned earlier). There

are very few duplicate frequency assignments down here, so this method is quite reliable.

❖ LOWFERS

A hardy bunch of experimenters known as LOWFERS (short for Low Frequency Experimental Radio Stations) can be found between 160 and 190 kHz. Under provisions of U.S. and Canadian regulations, 1 watt transmitters are allowed here with an antenna length not exceeding 15 meters (50 feet).

If there is a Lowfer within 100 miles or so of your location, you stand a good chance of hearing him when conditions are right. Under exceptional conditions, this range might be extended to 400 miles or more. A low-noise receiving antenna and a narrow audio filter are musts for Lowfer reception. The good news is that these stations are excellent QSLers.

Many countries have authorized higher power operations at 136 kHz, including a few experimental stations in North America, so it pays to check this frequency as well. Eventually, 136 kHz may become a ham band in the United States.

❖ WWVB

At 60 kHz, you will likely hear the pulsating sound of WWVB, Ft. Collins, CO. At first, some people mistake this signal for Morse Code, but it is actually a coded data stream for use by automated clocks and calibration instruments. Longwave is used to eliminate the variables often encountered in HF propagation.

❖ Natural Radio

At the bottom of the spectrum from 0 to about 10 kHz you may be able to hear the sounds of nature. This is the land of Natural Radio, which includes lightning-induced Whistlers, Tweeks, and the beautiful Dawn Chorus. Relatively simple receiving gear can be used to hunt these signals. The March and April 2000 editions of *Below 500 kHz* describe an easy-to-build natural radio receiver.

We haven't covered every possible signal you will hear on longwave, but there is certainly enough to get you started. Even if you don't become an LF addict, it's a nice place to come when you need a change of pace from the usual shortwave game. For me, longwave is an old friend – always waiting, always ready to welcome you back for another visit.



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Order FTR-100 today for only \$49.95 plus \$5.95 shipping direct from Grove at www.grove-ent.com or call 800-438-8155/828-837-9200 or send check or money order to Grove Enterprises, Inc., 7540 Highway 64 West, Brasstown, NC 28902.

Welcome to HF Operation

Well now... How did Uncle Skip get over here on this page? As most of you know, I have dutifully written the Beginner's Corner column here at *MT* since 1989. When my esteemed colleague Ike Kerschner N3IK decided to relax and enjoy the many pleasures of retirement, I jumped at the chance to switch seats. I know I'll be leaving my old column in the good hands of Ken Reitz, so all should be well as we begin to take a look at the wonderful world of amateur radio together.

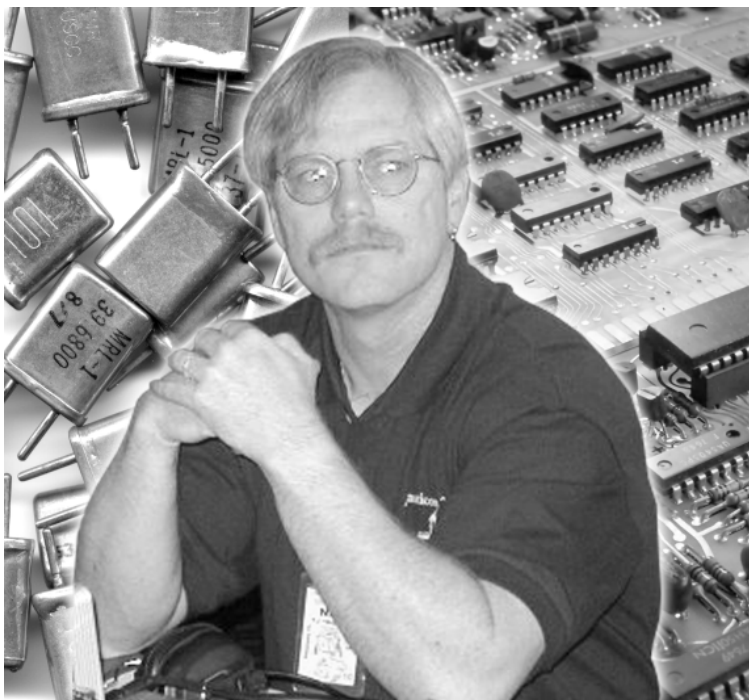
First... a bit of pedigree. I was first licensed WN2GHA way back in 1976. I quickly upgraded from Novice privileges to become WB2GHA and remained so for many years, working my way up the ladder to Advanced Class. In 1996 I undertook the challenge and passed my Extra Class, taking the callsign N2EI. Over the years I've given a good run to most aspects of the amateur radio experience. My major awards include "The Big Three," Worked All Continents (WAC), Worked All States (WAS) and DX Century Club (DXCC). I am now in the process of going for these awards for the second time around using only 5 Watts of output power (QRP). I've served on Staff of the Burlington County Joint Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES). I also serve on the Board of Directors of the Willingboro Area Repeater Group (WARG). I am a Life Member of the American Radio Relay League. I lost track of how many other ham clubs I belong to.

While I remain an "All Bands - All Modes" operator, my current areas of interest center around low power operation using alternate power sources such as solar cells. I build most of my own equipment these days and anything I don't build tends to get fairly heavily modified in the best spirit of the amateur radio art. (Translation: I just can't leave the covers on anything for more than a few minutes!) You can expect that I will be inviting you to join me in various solder melting experiences on a fairly regular basis.

I operate daily, using 2 meters (and occasionally 432 MHz) in the car. Most evenings I'm on HF around 7.040 MHz operating CW. On weekends I can be found chasing "Special

Events Stations" or operating in whatever contest I may find. I am not a particularly avid contesteer or DXer but I enjoy throwing my call into the pileups. Judging from my QSL card bills, I run well over 1000 QSOs a year. As any of you who have read my other column over the years can probably ascertain, I am mostly a dyed in the wool "Rag Chewer."

My goal for this column is to keep *MT* readers up to date with all the exciting developments in amateur radio. I firmly believe that operating and constructing are the cornerstones of the ham



hobby. In addition to the subtle wisdom and rapier-like wit that I plied in the Beginners Corner pages, I hope to clue folks in on new products and publications that will make the ham experience even more fun. I've already reached out to many readers and hams to get a handle on what folks want from this column. Of course your ongoing feedback and ideas will help us work together in making this column all it can be. With all that said... Let's get down to it!

❖ Operating hints for HF

First off, congratulations to all you folks who have taken full advantage of the new upgrade paths that FCC restructuring has allowed. I've already begun to hear a lot upgraded hams on the HF bands. Welcome one and all!

I know a few of you are a bit nervous about getting on to the "low bands." True, things are done just a bit differently than they are on the FM repeaters, so let's take a quick review of how to go about operating on the HF bands. You deserve to join in the fun of worldwide amateur operation after making the extra effort to upgrade.

One of the best ways to get an idea of how to act when operating HF is to do a bit of listening and note taking. Tune around any HF band that is active and you will hear dozens of communications going on. These

contacts will range from short, rapid contest exchanges up to casual conversations that sound a lot like two people talking on a telephone. You will also encounter "Net" operations where communication is strictly controlled by the Net Manager.

But don't spend *too* much time listening...I want you to get on the air and join in the fun. A good place to start might be the 40 meter SSB section of the band between 7.225 and 7.300 MHz. Remember that most voice operation on 40 meters is in the lower sideband mode so be sure to set your rig appropriately. Next, listen carefully for a clear spot on the band. Never assume that things are clear. Always ask, "Is this frequency is use?" followed with your callsign. Listen again and only then if you get no response, try a short general "CQ" call to see if you can drum

up a conversation.

An example of the more or less standard way of making such a call would be: "*CQ CQ calling CQ. This is N2EI, november two echo india, november two echo india, calling CQ and standing by.*" Stop and listen for a few moments before repeating this call again. Of course you will be using your own callsign and not mine. Also be sure to use standard phonetics for the letters. Cute, alternate phonetics such as "*november two electronic interceptor*" might sound neat, but remember, many overseas hams have a limited understanding of the English language. They may just not come back to non-standard phonetics and you will have missed a new country in your log book.

Okay, let's say somebody comes back to your call... Now what?! Well, what do you do when

you meet somebody new on the street? You introduce yourself. Give your first name, location, and a signal report to the other station using the standard 59 reporting system. The first number rates a signal's READABILITY from an unreadable 1 up through a perfect 5. The second number rates SIGNAL STRENGTH from a too-weak-to-understand 1 up through a perfect 9. CW operators use a second 1-9 to rate a signal's TONE. A common HF beginner's mistake will be to give a 599 voice report. This will usually result in some good natured kidding about appreciating your approval of the person's "tone of voice."

From there you should have no problem carrying on a conversation about the equipment you are using and any number of other subjects of general interest. Remember to identify yourself by way of your callsign at least every ten minutes. Of course, when you're finished, don't forget to include the universal ham way of saying best wishes "73" in your final exchange. Eg. "73 WB2KKS this is N2EI clear."

❖ Branching Out

Coordinating communications on HF is also easy. Use the term OVER to turn the conversation back to the other station and CLEAR to indicate the end of your conversation. It's just that simple. In all other cases, use plain language. Stick to these basic guidelines in the beginning and nobody on the air will have any idea that you haven't been doing this for years.

What if you hear another station calling CQ? Why not give them a call? When the station says "Standing by" give your callsign once. If the band is a bit noisy you may want to repeat it in phonetics once as well. Don't go overboard because the other station will likely want to come right back to you.

If you come upon a lot of activity with folks making rapid exchanges, you have probably stumbled onto a contest. Once again, open your ears. Most contests have very specific exchanges such as callsign, signal report, state or country, or some other combination of information. I've heard of some contest exchanges that include a person's name, age and favorite color! Once you get a handle on the correct exchange, jump on in. Respond to the station calling CQ CONTEST by giving your call phonetically *only once*. If the station picks you out of the crowd he or she will respond by saying your callsign and giving you the particulars of the contest exchange. Be prepared to respond in kind with a quick "73." A really fast contest station's response might simply be QSL - QRZ indicating that the station has your information and is seeking out another station to get a point from. If you miss something, don't be afraid to ask for repeats but keep things fast and specific as serious contesters don't have a lot of time for chit chat during the heat of battle.

If you are someone who is upgrading from Technician Class privileges to HF operating, you already know that 99.9% of all hams are very willing to work with you through those first few shaky contacts. The other 0.1% aren't worth

worrying about. If somebody begins to take himself too seriously, end the conversation with a quick "73 Old Man" and move on to new pastures. You can't do much with folks who have forgotten their first time on the air.

This particular column does have a bit of a beginner's angle to it. I'm an Old Dog learning new tricks. Like most hams, I want to give all of our newly upgraded brothers and sisters a leg up. But rest assured, friends, future columns will address the amateur radio interests of beginners and experts alike.

Uncle Skip's Book of the Month

With all the new HF privileges as the result of the recent FCC restructuring, the best book I can recommend for most folks who have "moved up" is *The ARRL Operating Manual*, \$25 from ARRL 225 Main Street, Newington, CT 06111-1494 1-888-227-5289. Now in its 7th edition, this book is the definitive guide to good manners and best behavior on the ham bands. No shack should be without it.

Uncle Skip's Website of the Month

Surf on over to <http://www.morsum.demon.co.uk/> This is the home page of *Morsum Magnificat*, a bimonthly journal for all Morse enthusiasts. This web site serves to describe what is typically found in the *Morsum Magnificat*.

There is much of interest about many aspects of the World of Morse. Don't be too surprised if you find yourself falling in love with the CW mode of operation.

Uncle Skip's Product of the Month

I've been experimenting a great deal with "Ladder Line" balanced feedlines lately. They have a lot to offer hams who can only get away with putting up a simple wire antenna. A product that helps make using ladder line a breeze is the EMTECH Ladder Grabber, \$7.95 including shipping and handling. The Ladder Grabber provides a novel center insulator that is an excellent way to join wire antennas to balanced feedlines, providing "strain relief" while allowing for solid mechanical contact. After any number of "homebrewed" center conductors, it is clear to me that this simple device is well worth the cost. Order from EMTECH, 1127 Poindexter Ave. W., Bremerton, WA 98312 or check out their website at <http://emtech.steadynet.com/grabber.htm> for more information.

Uncle Skip's Contest of the Month

The North American Sprint (CW) 0000 - 0400 UTC Sept. 10 and (SSB) 0000- 0400 UTC Sept. 17. This is a great short contest to try out some of those techniques we talked about in this month's column.



TrunkTrac®
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TrunkTrac, the first, and one of the most sophisticated trunk tracking technologies available, is now even better. New pricing and additional features make TrunkTrac your best choice if you're serious about tracking Motorola Type I, II, III, and Hybrid systems. TrunkTrac now supports the BC895XLT, PCR1000, R7000, R7100, R8500, R9000, and the RS Pro 20xx series with an OS456/535 board installed.

Competing products cost more, don't decode the control channel, can't deal with Type I fleet maps, and won't properly decode many Type II talk groups. TrunkTrac's patented technology let's you do all that and much more. TrunkTrac consists of easy to use menu driven software, an FCC Class B approved signal processing board you plug into an ISA slot in your PC, a serial interface, and a discriminator buffer for your scanner. Everything you need, including cables, is supplied. With TrunkTrac you'll have access to Private Call and Interconnect activity and can follow up to four systems at once. Any combination of VHF/UHF/800/900 MHz systems, including FED-SMR trunking, is supported. TrunkTrac lets you assign a 35 character alpha tag (up to 1000/system) to all IDs. You can set Lockouts, Personality Files, Scan Lists, and much more. TrunkTrac lets you log system activity to an ASCII file for database import and traffic analysis. We think you'll like TrunkTrac so much it comes with a 30 day money back guarantee. And For a limited time, when you purchase TrunkTrac, we will install the discriminator mod in your scanner for free.

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Groundplane Antennas

It seems likely that some kind of groundplane antenna design can be found at the majority of VHF and UHF commercial and utility base stations. These antennas are also popular as a base-station antenna for many monitoring stations. Groundplane antennas give good non-directional coverage, and even the most simple of these, the quarterwave groundplane design (fig. 1A), has sufficient gain for most applications.

As with most other groundplane designs this antenna also has quarter wavelength radials. On the other hand sometimes radial length is varied while still retaining a half-wavelength total length for the vertical element plus any one radial. In this way the feedpoint impedance can be varied as necessary to match the feedline, but the more common way to get the feedpoint impedance to a value usable with 50-ohm coax is to droop the radials as shown in fig. 1.

In addition to their nondirectional coverage, groundplane antennas give a good amount of low-angle vertical radiation. On VHF-UHF this means good all-around coverage of local signals to the visual horizon as seen from the antenna, and even somewhat beyond to what is called the "radio horizon."

For HF these low angles mean excellent nondirectional DX work. However, HF and MF groundplane antennas are more of a problem to construct due to their size, but if their groundplane is elevated sufficiently above ground, and they have eight or more radials, then results can be quite good. It's interesting that at VHF and higher frequencies one of the groundplane antenna's inventors noted that only two radials are needed for full performance.

Groundplane antenna designs which offer gain over the quarterwave design include the halfwave, 5/8 wave, and the coaxial-collinear designs. This gain is achieved by concentrating the antenna's performance at lower vertical angles with the quarterwave having something like -1.8dBd*, the halfwave 0 dBd, the 5/8 wave 1.2 dBd, and an 8-section, coaxial-collinear 6 dBd.

❖ Let's Make an Antenna:

When the gainer-type designs are utilized, some form of matching must usually be employed to obtain a decent match between available coaxial-cable impedances and the antenna's feedpoint. For this and other reasons it's much

easier to construct a quarterwave model. The quarterwave is also a good performer as attested by its popularity, so let's make a quarterwave for now, and another time we'll tackle one of the gainers.

❖ Quick and Easy Skyhook

The simplest way to implement the quarterwave design at VHF and higher frequencies is perhaps to strip the outer conductor and inner insulation from the inner conductor of a length of coax cable for a quarter wavelength. This makes your vertical element (fig. 1B).

A quarter wavelength in conductors of the diameter we'll use in our antennas is:

$$234 / \text{frequency (MHz)} = \text{quarter wavelength (feet)}$$

OR

$$71.3 / \text{frequency (MHz)} = \text{quarter wavelength (meters)}$$

Cut the elements for a frequency near the middle of the band you wish to use.

Connect two or more wire quarterwave radials to the coax outer conductor (shield) near the base of the vertical element, and space them equally around the cable's perimeter.

Seal the open coax end with coax sealant, and you have a quick and cheap quarterwave groundplane antenna.

Mount the antenna as high as is practical, and tie the radials so that they droop at about 45 degrees.

This design is light, cheap, and portable, but not for hard use.

❖ A More Durable Model:

Using some PVC tubing about 1 and 5/16 inch

in diameter, a couple of PVC end caps, a bit of wire, and an SO-239 coax socket, it is possible to make a neat and durable groundplane for VHF and higher frequencies (fig. 1C and 1D). For lower frequencies where the elements are too large for this approach you can attach the elements directly to a mast made of insulating material (varnished wood, plastic, etc.).

I used bare, size 12, copper house-wiring wire for my antenna's elements, but they are soft and bend easily. Copper-coated brazing rod (available at some large hardware stores, and welding supply houses) makes a more rigid antenna, and those elements will remain straight and in position much better than the copper house wire. Below perhaps 100 MHz or so, larger-diameter elements are necessary due to element length. Metal tubing or pipe, or metal electrical conduit can be used for the longer elements, and they may need guys for support.

For our model the ends of the radials are bent and soldered into mounting holes in the socket. The vertical element is soldered in place to the center-connection of the socket. The vertical element and radials each are a quarter wavelength long. For accurate length at VHF and higher measure the radial lengths from the center of the socket, and the vertical element length from the top of the socket.

Four short, vertical strips, evenly spaced around the tubing's perimeter, are cut out of the PVC tubing's top-end to allow the SO-239 to nest down into the top of the tubing just below the lower edge of the top cap. The socket seats into the tubing with its corners resting in the slots made by removing the strips.

Drill a hole in the top cap just large enough to allow the vertical element to pass through. Solder the center conductor of the coax feedline to the socket's center contact, and the coax outer conductor to the socket's base. Put the socket into the slots (fig. 1D). A hole in the tubing's bottom cap allows the coax-cable plug and cable to exit through that cap.

Assemble the completed antenna into the tube and caps, and seal any cracks where water could get inside the tube except for the bottom cable hole - it's a vent. With the radials drooped at about 45 degrees, 50-ohm coax is a good match for the antenna's feedpoint impedance.

Mount the antenna as high and in the

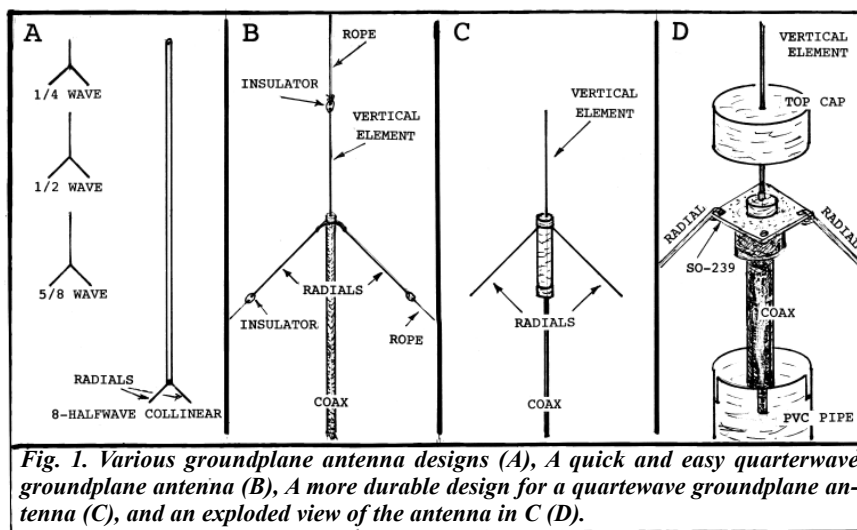


Fig. 1. Various groundplane antenna designs (A), A quick and easy quarterwave groundplane antenna (B), A more durable design for a quarterwave groundplane antenna (C), and an exploded view of the antenna in C (D).

This Month's Interesting Antenna-Related

Web site:

I was alerted to this month's site <<http://unisci.com/stories/20002/0609001.htm>> by MT reader Henry LaViers. This site discusses a new antenna for the SETI project. Functioning in a manner roughly analogous to the human eye, this antenna looks at the whole sky at once rather than at one region of the sky as traditional radio-telescope antennas do.

clear as practical. If you live where lightning is probable don't forget lightning protection for these antennas. The minimum is never use an outdoor antenna during weather that could produce lightning, and disconnect and ground the antenna when it is not in use.

Happy monitoring!

RADIO RIDDLES

Last Month:

I said "We sometimes see the term "conjugate" mentioned in antenna and feedline articles. What does this term mean, and who cares anyhow?"

Well, in functional terms this is the amount of resistance, and amount and kind of reactance which, if connected between an RF power source and its load, will allow an optimum match between the source and load. Optimum matching means maximum power transfer will occur between the source and load.

For transmitting an approximate conjugate match can be obtained by connecting and properly tuning a transmatch ("antenna tuner") between the RF source and the transmission line connected to the load. In this case the load would be the whole antenna system (combined feedline and antenna).

Hams often need to do this kind of matching to get their antenna system to accept the full output of which their transmitter is capable.

This Month:

OK, so we need good matching for transfer of a transmitter's RF output to the antenna system. What about transferring an antenna's received signals to the receiver; is a conjugate match important there, too?

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. Til then Peace, DX, and 73.

* dBd means decibels gain compared to a halfwave dipole.

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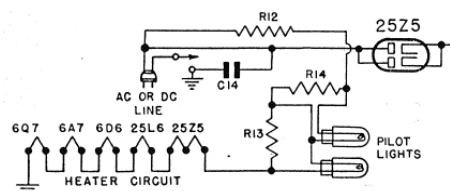
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Your Grounding in Safety (Pun Intended)

With the conclusion of last month's column, we completed the first part of the plan I worked out with the *MT* editorial staff when I began writing this column last January. You now have a pretty good orientation to the evolution of the broadcast receiver from the early 1920s to the period just before World War II – which is the end of what most people consider to be the classic era of the radio receiver. Of course, even though I've taken several months to give you your orientation, there are – of necessity – gaps in the coverage. It would take a big book to present what I would consider to be a really thorough treatment.



Partial schematic of early a.c.-d.c. power supply circuit shows that one side of line is grounded when power switch is closed.

❖ Expanding Your Knowledge Base

I encourage you to continue to improve your grasp of the radio receiver "universe" on your own. There are many excellent collector books on the market, and you now have enough background to know what period(s) might especially interest you.

Two places to look for good books (not to mention antique radio restoration supplies and services) are *Antique Radio Classified Magazine* (write ARC at P.O. Box 2, Carlisle, MA 01741 for a free sample issue and/or check their web site at www.antiqueradio.com) and Antique Electronic supply (write AES at 6221 S. Maple Ave., Tempe, AZ 85283 for a catalogue and/or check their web site at www.tubesandmore.com). *Antique Radio Classified* is a major marketplace for the buying and selling of antique radio items and in addition carries interesting articles on all aspects of the antique radio hobby.

You might also like to take a look at *The OTB*, quarterly newsletter of the Antique Wireless Association. I happen to be editor of that publication. *The OTB* is currently running a series of articles for newcomers to the hobby; these will expose you to a point of view of an author other than myself. But the publication is primarily known for in-depth articles on radio history and hardware, reflecting the varied interests of its 4000-odd hard-core antique radio enthusiast members. Get a sampling of *The OTB* by viewing our on-line edition on the AWA web site at

www.antiquewireless.org. Those without access to the internet are encouraged to write the AWA for information at Box E, Breesport, NY 14816.

Another excellent and enjoyable way to improve your background in this fascinating hobby is to attend some of the many antique radio meets that are held around the country – particularly during the late spring, summer, and fall. All have flea markets where you can browse to your heart's content among tables full of radios, parts, documentation – and more. You'll have a chance to chat with friendly folks who will share their knowledge with you. And many of the larger meets include seminars on various aspects of radio restorations and history. The AWA's Rochester, NY, meet (September 6-9 this year) is one of the major ones – but check ARC's web site, or the sample issue they will send to you, for many more listings.

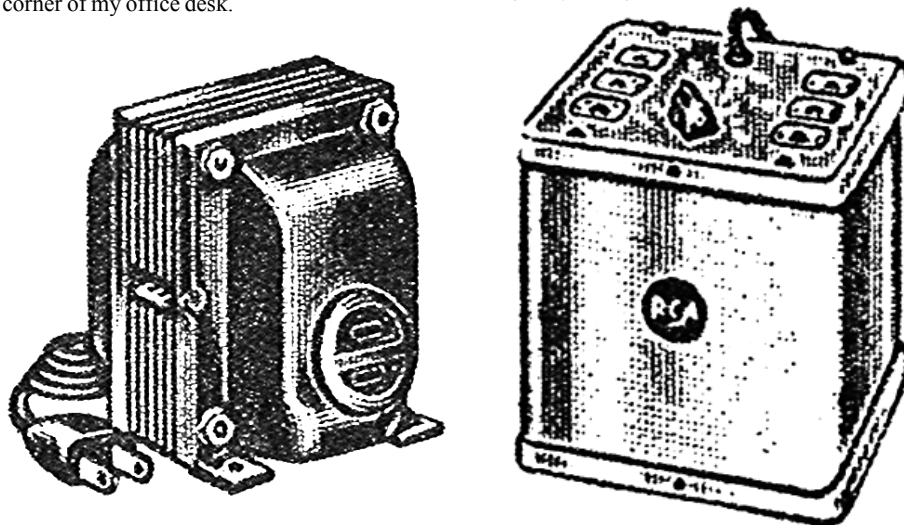
❖ Grounding Safety

Moving right along to the hands-on stuff, let's talk about setting yourself up for radio restoration. First, I want to assure you that you can get along fine without a formal dedicated workbench, or with a very small one, if you need to. I do have a good bench myself but, like many of us, when I get caught up working on a radio, neatness goes out the window and I quickly use up all the available space. If I have more space, I'll use up more – but I can easily get along with less. In a pinch, when my formal bench is covered with an ongoing project and I have to work on a different one, I've been known to utilize a temporarily empty corner of my office desk.

If you have a nice space in your basement, utility room, or wherever that you can dedicate to this hobby, great! Set up a sturdy table or old desk and equip it with shelves at the back to hold reference books and test equipment. If you don't, don't worry. But, whatever space you have available to use, there are some safety issues that need to be addressed. One of these centers around the grounding practices of your local electric utility.

For reasons that we needn't go into here, you will find that one of the two wires in every electric outlet in your home is connected to earth ground. If you don't believe this, connect one wire from an a.c. line tester, or even a small electric light bulb, to a known earth ground such as a water pipe or radiator pipe. Slip the other wire (obviously being careful not to touch the bare end) into one of the slots in a convenient a.c. outlet. If the lamp doesn't light or the tester gives no indication, try the other slot. If your outlet wire is making good contact, your lamp or tester will show the presence of full line voltage.

Another thing you need to be aware of is that a concrete floor laid in contact with the ground, if damp, is almost as good a conductor of electricity as a metal plate. If your workbench is in a basement or utility room with a bare concrete floor, you are at risk. If, while working on a radio chassis, your hand happens to come in contact with the "hot" (non grounded) side of the line while your feet – perhaps in damp shoes – are in contact with a damp concrete floor, current from the line will flow through your entire body, giving you a nasty shock and perhaps (not inconceivably) putting out your lights forever.



Isolation transformers such as you might find at a radio meet flea market. Oblong unit is a 500-watt RCA; the other one, by Newark, is rated at 150 watts.

For such environments, a “ground fault interrupter” (GFI) outlet for your workbench is a must. Install it in place of a regular outlet. With one of these in place and working properly, the smallest current flowing (maybe through your body) between the “hot” side of the line and earth ground will trip a special breaker, cutting off the current. This is something that a conventional fuse or circuit breaker cannot do.

With your new GFI outlet installed, check for proper operation by pressing its “test” button. This should trip the ground fault interrupter, making the “tripped” button pop out. If it does, reset it by pressing that button in again; if it doesn’t, consult an electrician to see what’s wrong. Once you have a working GFI outlet, connect a good test strip having a proper ground prong on its plug to the outlet, and the radios and pieces of test equipment you plug into that will also have ground fault protection.

❖ Isolation Transformers

With the power line issues addressed, we need to look at the safety problems surrounding another grounding practice. This one is associated with the radio receivers themselves—especially a.c.-d.c. receivers. When designing transformerless power supplies to minimize costs (see the June, 2000 column), the engineers found it convenient to connect one side of the line (in effect, the “B-” connection of the power supply) to the radio chassis.

In those casual pre-OSHA days, nobody worried and nobody complained. Radio cabinets, backs and knobs prevented the user from contacting any metal parts. But if one of those protections was compromised, the listener could easily be shocked out of his socks! From what you know now about power company grounding practice, you can envision the danger if the radio plug happened to be inserted in such a manner that the radio chassis was “hot.”

You, of course, will often be working on such radios while they are removed entirely from their cabinets. Furthermore, you may well be connect-

ing the ground terminal of a piece of test equipment to radio chassis ground—and if the test equipment ground is connected to the outlet ground via a plug with a grounding pin, you can imagine the explosive short circuit that might occur if the radio chassis were plugged in “hot.”

The proper way to avoid this danger is to get yourself an isolation transformer. Such a transformer has a 115-volt primary and a 115-volt secondary. Plug the primary into the wall socket and the radio into the secondary. The set still receives the proper line voltage, but now has no metallic connection to the a.c. line. You should use an isolation transformer even when working with transformer-powered radios. These frequently have capacitors going from both sides of the line to chassis ground for noise suppression purposes. And in a 50- to 60-year old set, the capacitors are likely to be leaky.

Isolation transformers are expensive to purchase new, but they be bought at reasonable prices at antique radio meets and hamfests. They also frequently turn up in surplus sources. If you can find a couple of identical hefty low-voltage transformers (such as transmitter filament transformers or transformers for battery charging service), you can connect the two secondaries together; then put a wall plug on one of the primaries and a receptacle for the radio on the other. Look for transformers rated at about 150 watts (In the case of the low-voltage transformers, multiply secondary volts by secondary ampere rating to get a wattage figure).

❖ New Reprint From Lindsay

If you are not familiar with the reprints of technical books offered by Lindsay Publications (“Unusual technical books, past and present, of exceptionally high quality revealing skills and secret processes almost forgotten”), write now for a free copy of the profusely-illustrated, breezily written catalogue. Address: Lindsay publications, P.O. Box 538, Bradley, IL 60915. Or check the Lindsay web site at www.lindsaybks.com.

Lindsay has placed many classic radio books

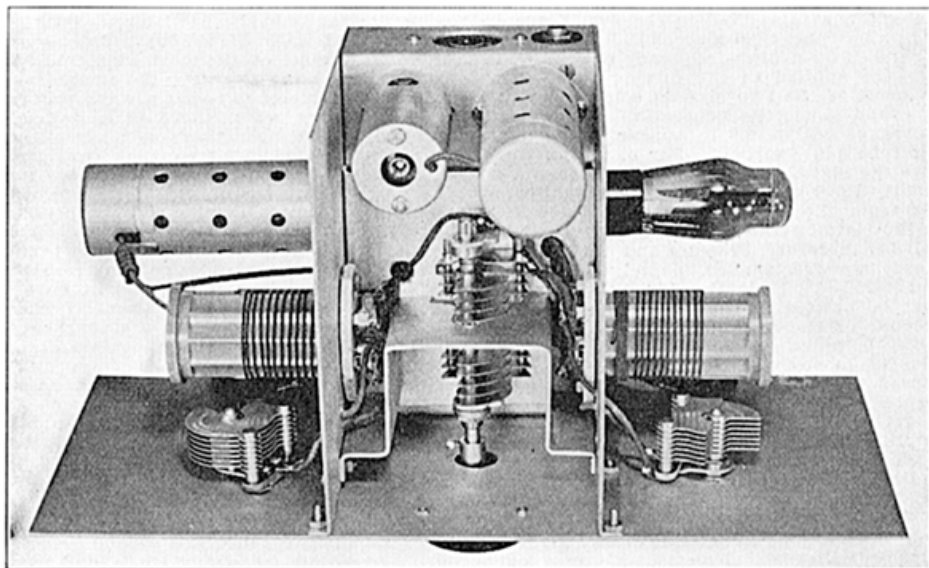
back in circulation, most recently the *1936 Radio Handbook for Amateurs and Experimenters* by Frank Jones. This is the second edition of a California-published manual that has been updated regularly throughout the years. Then familiarly known as “the Frank Jones Handbook,” people were calling it “the West coast handbook” by the time I bought my 11th Edition in 1947. This differentiated it from the other radio Amateur’s “bible,” the *ARRL Handbook*, which was, and is, published in Newington, CT.

In the more recent past, *Radio Handbook* was edited for many years by William Orr, W6SAI, a prolific and most knowledgeable writer on amateur radio topics; the book was last published, I believe, by Howard W. Sams & Co. of Indianapolis, IN. The last edition I know of is the 23rd, published in 1997.

To browse through the 1936 second edition is to browse through a fascinating time capsule of pre-WWII amateur radio practice. In addition to its value to those interested in researching bygone radio techniques, the reprint will be very helpful to the growing number of amateurs and short wave listeners interested in building and using replicas of vintage equipment.

This beautifully-produced reprint (I have a copy of the original in my library, so I can compare them) reflects the original in that it is soft cover and contains an index but no table of contents. However, the 360 pages include sections on radio theory, receivers, transmitters (including “cutting edge” 10-meter and UHF equipment), antennas, power supplies, test equipment, tube characteristics, amateur radio practice and much more. An advertising section at the end (about 32 pages) provides a fascinating look at the radio parts and equipment being sold at the time. Available from the publisher at \$19.95 plus s&h.

More on your restoration workbench next time.



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When is a PC Controlled Radio Not a PC Controlled Radio ?

Has John finally gone around the bend? Flipped his lid? Gone bonkers? Nooo. Not yet. (Although, the people I work with might disagree.) This seemingly paradoxical question now has a useful answer; "When it is not controlled by a PC."

In the last few columns we've been talking about one of my favorite monitoring subjects; PC controlled radios. This is one of my pet subjects because I watched it develop during my 30 year electronics career. Today, we are lucky to have a choice of more than three commercially available PC controlled radios from TenTec, Icom and WinRadio. And, just when I thought I had seen it all, some smart people have uncoupled these radios from personal computers!

Most recently (being in the personal computer data communications and peripheral business), I have been watching sales of PDA (Personal Data Assistants), such as Palm Pilots. Their sales are shooting through the roof, surpassing unit sales of laptops! Initially, I pondered, "What can you do with the limited computing power of a PDA?"

Today, after seeing first hand how a Palm can host very complex applications such as fingerprint identification, I began thinking about its application to monitoring. As it turns out, a few guys were thinking this years before, in 1998. The result is two programs which allows a Palm III, V or VII to control an ICOM IC-PCR1000 ... without a PC in sight!

❖ What Hardware Do You Need?

"Not much" is the answer. If you have one of the aforementioned Palm models and a PCR1000, all you are lacking is a null modem plug (or cable). These are not true modem. Instead, they re-wire the serial port receive line with the transmit line (pins 2 & 3). Some also connect serial port control lines in a way to make it electrically look as if an active modem is connected.

Connection is simple. The Palm cradle, usually connected to your PC, is connected to the PCR1000 via a Null Modem. The plug on the end of the cradle is a 9 pin female "D" type. The PCR1000's serial connector is also a 9 pin female. Therefore, a null modem with both sides male would be perfect for the job. But the null modem I happened to have on hand had one side female and one side male. This required a male to male adapter.

Null modem and gender changers are available from Cyberguys (1-800-892-1010 or www.cyberguys.com) for under ten dollars total. You can also check Radio Shack. Once the Palm cradle and the PCR1000 are connected together via a null modem, you are ready to pick software.

❖ What Software Do You Need?

The first program I tried was written in 1998 by Richard Gopstein and is simply called PCR-1000. The file is available in zip form from http://QSY.to/pcr/pcrpilot.zip. Once unzipped on your PC, use your HotSync Manager and Install Tool programs to move the resulting unzipped file ending in ".prc" to your Palm.

Running this program on the Palm results in the Palm screen, Figure One. As you can see, this is a simple program which allows you to control frequency, mode, filter width, squelch and volume levels. It works great and is an excellent vehicle of Richard's to show the potential of the Palm platform. I thank Richard for making it available for free to the monitoring world.

❖ Isn't Evolution Great!

Now fast forward to the year 2000. A fellow named Geoff Wicks has produced a series of Palm-PCR1000 programs. The latest, at the time of this writing, is PCR Pilot3C. The 3C version is quite a slick program. See Figure Two. Geoff has been able to cram a lot on this single screen. As before, frequency, mode, filter width, squelch and volume levels can be controlled. Controlling the frequency function has been augmented with a Step function which sets the tuning step. Tuning can be accomplished a number of ways, including direct frequency entry, tuning in steps via the up/down arrows next to the step numbers, or tuning via the buttons below the center of the screen.

In addition, AGC, attenuation, and noise blanker settings can be selected from the 3C screen. A very useful, signal strength, bar graph S-meter can be displayed on the Palm's screen.

Finally, Geoff has included a small, but useful, memory bank. This 26 memory feature can be seen in Figure Two as two rows of letters. Each letter represents a memory which all the settings (frequency, volume, squelch, etc.) can

be stored and recalled with a touch of the letter. Each memory also can contain a user inputted description of the stored frequency. In Figure Two, we can see that 162.4 MHz is "NOAA Weather." This is the beginning of great things!

Again,

I would like to thank Geoff for his efforts and making this program available to the monitoring world for free. Download this program at www.powerup.com.au/~gwicks/PCRPilot.htm.

❖ "Make Your RX-320 a Portable"

With this headline Skytronics heralds the introduction of PC-less control of Ten-Tec's RX-320. Their product, RX-320 Controller, is a different approach to the same application we saw above. The difference here is that Skytronics has chosen to provide both software and dedicated hardware. The result, as Skytronics' website proclaims, is "Replace your computer with the RX-Control unit."

What is an RX-control unit? It consists of a printed circuit board utilizing a flash microcontroller, LCD dot matrix display and a membrane keypad. The beta unit I used was housed in an aluminum box 10"x 6"x 3.5" which included a "tuning control," speaker, four AA batteries, and connectors for headphones and the serial connection to the RX-320. I was informed by the people at Skytronics that this case would be replaced with a custom case.



Figure 1: The Palm Screen From Gopstein's PCR-1000, circa 1998



Figure 2: PCR Pilot3C's Palm Screen, Wick's Latest

❖ Using the RX-320 controller

Not much to do here, but to connect the control unit to the RX-320 via the serial cable and external speaker cable. That's it.

The keypad serves two functions: Numeric input of data and selection of command modes. The rotary tuning control provides input for each of the command functions such as frequency tuning and volume setting.

The control unit's LCD displays four line of information. See Figure 3.

Line 1 displays frequency, mode and AGC.

Line 2 displays tuning step, bandwidth and pass-band shift.

Line 3 displays volume, memory location-frequency-mode.

Line 4 is a catch-all status line usually indicating the command mode currently selected.



Figure 3: Skytronics' RX-320 Controller Display

Since the display has no labels, it takes a bit of time to get comfortable with it.

❖ What Can It Do?

Pretty much all that you can do with your Ten-Tec RX-320 connected to your PC. Frequencies can be entered directly via the keypad, recalled from its seventy (70) memories via MEM/RCL buttons on the keypad, or tuned via the rotary control.

The tuning step is set from the keypad using the Step key. The value is selected by successive presses of the Step key until the desired tuning step is displayed on the LCD. In a similar manner, the AGC, BW (bandwidth) and PB (passband tuning) is achieved. The keypad commands are quite intuitive and easy to use.

One function was unexpected. In an effort to minimize electromagnetic interference from the digital circuitry, a Low EMI mode is provided as seen in Line 4 of Figure 3. The Controller automatically defaults to this mode after two minutes without user input. Any input in the form of a button press or rotation of the tuning knob, brings all functions back to normal.

❖ Different Strokes

Skytronics has gone their own route with this approach of controlling a PC-Controlled receiver without a PC. The RX-320 Controller is available in kit form for \$89.95 (plus \$5 shipping in

the US), not including case, serial cable, speaker or batteries. Check out their latest offerings at <http://members.home.net/skytron/>.

I'm sure this is just the beginning of programs and products to add even more flexibility to PC-controlled receivers. As you find new ones, email me with the info so we can share it with our readers.

❖ Smaller, More Powerful

That seems to be the credo of the insane electronics industry. In a short few years we have

put desktop computer capabilities into pocket calculator-sized devices. Before you know it, we will have the power of a Pentium computer and color display in our sunglasses. But one major technological problem still exists – one which limits the usefulness of our sunglasses, or even our Un-PC-Controlled receivers. Power sources. Miniature, long-life, power sources have yet to be developed which match the tremendous advances in integrated circuit development. Think of it: We are powering 21st century microelectronics with 19th century battery chemistry.

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Ham Radio is Now More Accessible Than Ever!

If you've ever thought about becoming a licensed amateur (ham) radio operator, now is the perfect time! The Federal Communication Commission (FCC) has just acted to make the amateur radio service more accessible than ever before!

The entry level class of amateur radio license now requires only one simple 35 question test covering basic operating procedures, beginner's electronics theory, and simple emergency communications. Best of all, the FCC has reduced the Morse code requirement for higher classes of license. One simple Five Words Per Minute Morse code test and additional theory tests get you access to all of the amateur radio world wide bands, enabling you to talk to other hams all over the world!

The cost of a "basic" handheld radio is under \$200, less than many scanners. Most amateur radios include wideband receive capabilities on par with scanners in addition to the ability to transmit on ham radio frequencies.

HamTest.com is your complete resource for getting your ham radio license. You can study the entire question pools for the new amateur radio license exams, find an upcoming test location, get help on our message board, or even take a simulated test on-line to check your progress. If you already have a ham radio license, you can study for an upgrade, or check out our Restructuring FAQ to see what the new license system means to you!

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Sangean's Slick DT-300VW Radio

Stay in one place long enough and sooner or later you'll be hit by some nasty weather – weather bad enough to potentially threaten your life.

Not a single state is immune from severe weather in some form: lightning, tornadoes, damaging winds, hail, extreme heat, extreme cold, flash floods, river floods, coastal storms, hurricanes, blizzards, ice storms, drought, and even tsunamis. Bad weather kills literally hundreds of people a year in the United States.

Bad weather would probably kill more people in this country if it weren't for the National Oceanic and Atmospheric Administration Weather Radio system. This network of more than 480 stations covers most of the United States and associated territories with round-the-clock weather forecasts, warnings, watches, and other hazard information. These stations broadcast on: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550 megahertz.

At least a couple of times in the last three years the Elliott family has spent part of an evening in our basement because of severe storms and tornadoes. NOAA weather radio advised us to "seek shelter immediately," and we did. The three of us trundled into the basement with our arms loaded with stuff – lanterns, flashlights, and a weather radio.

One of the nights was particularly interesting because one of the very first casualties of the storm was the nearest NOAA Weather Radio transmitter. It suffered a direct hit from lightning and was out for a couple of days. When we lost the weather radio, I began to wish I had a really portable AM/FM radio and maybe something that I could use to monitor the TV meteorologists.

❖ Tiny Multiband

So imagine my glee recently when I was paging through the C. Crane Company catalog (call 1-800-522-8863 to get one) and found the Sangean DT-300VW TV/AM/FM-Stereo Weather Digital Radio. The name is larger than this tiny radio – it measures just 2.25 inches wide by 3-7/8 inches high by .5 inch deep, certainly small enough to slip into a shirt pocket. Pow-

ered by two AAA batteries, it receives AM and FM broadcast radio, sound from TV channels 2 through 13, and NOAA Weather Radio broadcasts.

The DT-300 (for short) also has 36 memory presets, clock and alarm, a 1 to 180 minute timer, memory scan, auto preset function, a low battery indicator and a 90-minute auto shut off function.

On the front of the radio, there are six buttons: MONO/Alarm, BAND/Time, a couple of slewing buttons, a button for selecting various

justing the volume, a POWER button and a sliding lock switch. I particularly thought the lock switch was a terrific idea. This radio is so small that it can be your constant companion, but you wouldn't want it to turn on inadvertently while it's tucked away in your pocket, backpack or briefcase and run the batteries dead. The lock switch prevents just that. If the lock is used when the radio is on, it prevents inadvertently switching off at a crucial moment. (After all, you wouldn't want to miss the answer to Final Jeopardy while you're cruising the yard on your riding mower, would you?)

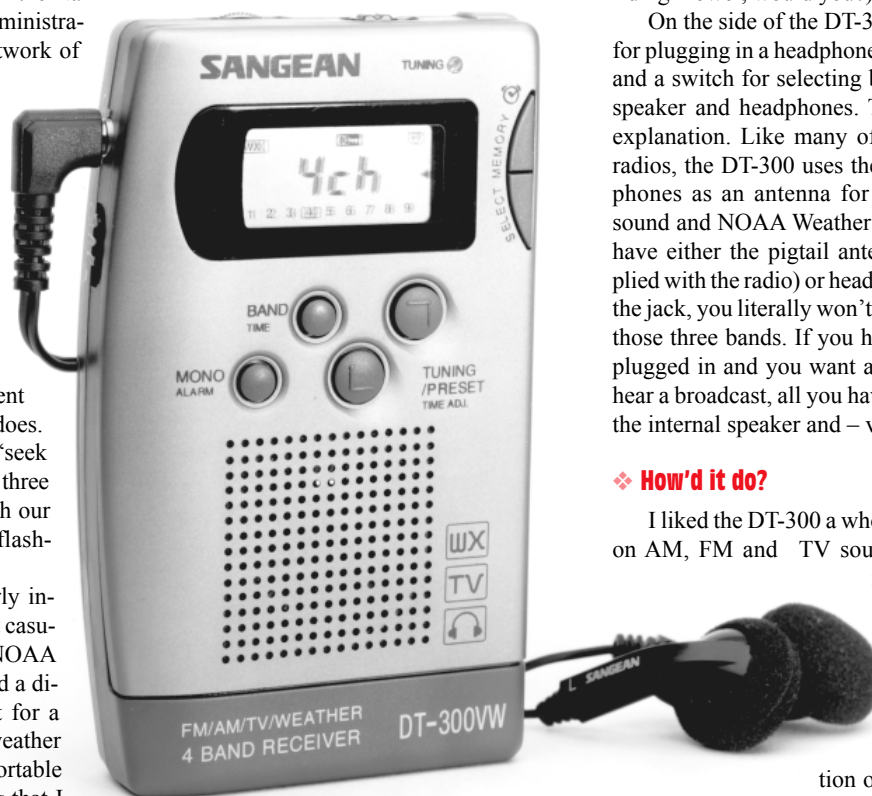
On the side of the DT-300, there is a socket for plugging in a headphone or a pigtail antenna and a switch for selecting between the built-in speaker and headphones. This deserves some explanation. Like many of the walkman-type radios, the DT-300 uses the wire for the headphones as an antenna for receiving FM, TV sound and NOAA Weather Radio. If you don't have either the pigtail antenna (which is supplied with the radio) or headphones plugged into the jack, you literally won't receive anything on those three bands. If you have the headphones plugged in and you want a group of people to hear a broadcast, all you have to do is switch on the internal speaker and – voila! – you have it.

❖ How'd it do?

I liked the DT-300 a whole lot. Performance on AM, FM and TV sound was simply terrific. I particularly enjoyed hearing stereo FM through the earbuds that came with the DT-300. Reception of weather channels,

however, was not as good as the best weather radios, but it was better than some. I would rate the weather radio reception as good but not excellent. Performance on all bands, obviously, will depend a great deal on conditions in your area.

The bottom line: the DT-300 would make an excellent addition to any family's emergency preparedness kit and is an superb walk-around radio companion. Suggested retail price of the DT-300VW TV/AM/FM Stereo Weather Digital Radio is \$89.50.



functions, and a memory button. At top center, there is a liquid crystal display that lets you know what's going on with this diminutive receiver and above that, a red light emitting diode tuning indicator. At bottom center, you'll find a roughly once-inch-square grill for the radio's tiny speaker.

On the back of the radio is a hatch that can be slid down to insert the two AAA batteries. On the top panel, there is a thumbwheel for ad-



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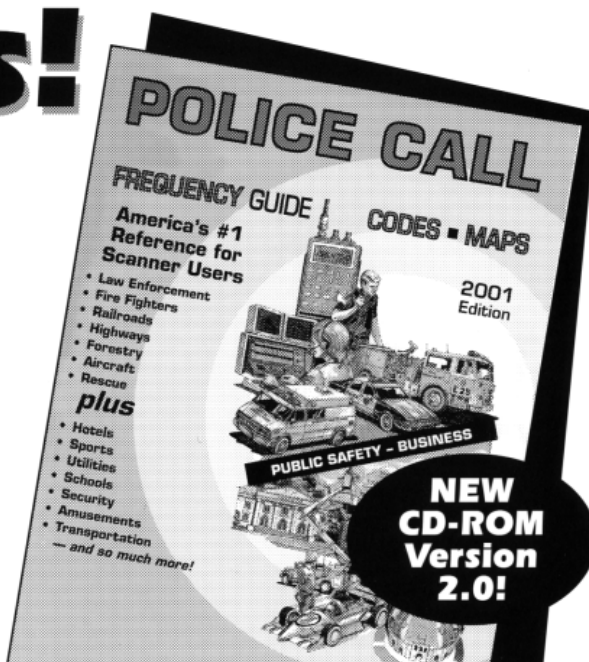
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Synchronous detection - What is it and why is it used?

Receivers today boast many facilities. Memories, phase locked loops, direct digital synthesis, digital signal processing and much more. One facility that can be very useful on the shortwave bands is synchronous detection or demodulation. Unfortunately little is written about this, and often it is a matter of accepting that it must be better than any normal options because it is included as a feature in the receiver specification.

Synchronous detection is used for the detection or demodulation of amplitude modulation (AM). This form of modulation is still widely used for broadcasting on the long, medium and short wave bands despite the fact that there are more efficient forms of modulation that can be used today. The main reason for its use nowadays is that it is very well established, and there are many millions of AM receivers around the world today.

In any receiver a key element is the detector. Its purpose is to remove the modulation from the carrier to give the audio frequency representation of the signal. This can be amplified by the audio amplifier ready to be converted into audible sound by headphones or a loudspeaker. For AM most receivers use an envelope detector using a semiconductor diode. These detectors have a number of disadvantages. The main one is that they are not particularly linear and distortion levels may be high. Additionally their noise performance is not particularly good at low signal levels.

These detectors also do not perform very well when the signal undergoes selective fading as often occurs on the shortwave bands. An AM signal contains two sidebands and the carrier. For the signal to be demodulated correctly the carrier should be present at the required level. It can be seen that the signal covers a definite bandwidth, and the effects of fading may result in

the carrier and possibly one of the sidebands being reduced in level. If this occurs then the received signal appears to be over-modulated with the result that distortion occurs in the demodulation process. (See figure 1)

❖ Diode envelope detector

In virtually every receiver a simple diode envelope detector is used. These circuits have the advantage that they are very simple and give adequate performance in many applications.

The circuit of a typical detector is shown in Figure 2. Here the diode first rectifies the signal to leave only the positive or negative going side of the signal, and then a capacitor removes any of the remaining radio frequency components to leave the demodulated audio signal. Unfortunately, diodes are not totally linear and this is

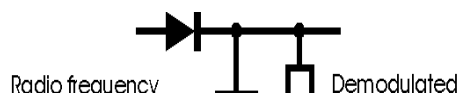


Figure 2 An envelope detector for AM signals

the cause of the distortion.

❖ What is synchronous demodulation?

Signals can be demodulated using a system known as synchronous detection or demodulation. This is far superior to diode or envelope detection, but requires more circuitry. Here a signal on exactly the same frequency as the carrier is mixed with the incoming signal as shown in Figure 2. This has the effect of converting the frequency of the signal directly down to audio frequencies where the sidebands appear as the required audio signals in the audio frequency band.

The crucial part of the synchronous detector is in the production of a local oscillator signal on exactly the same frequency as the carrier. Although it is possible to receive an AM signal

without the local oscillator frequency on exactly the same frequency as the carrier this is the same as using the BFO in a receiver to resolve the signal. If the BFO is not exactly on the same frequency as the carrier then the resultant audio is not very good. (See figure 3.)

Fortunately this is not too difficult to achieve and there are a number of ways of achieving this. The most obvious is to use a system like that shown in Fig. 4. Here the received signal is passed straight into a mixer. However some of the signal is taken off and filtered using a filter to extract the carrier. This filter must have a narrow bandwidth to remove any of the sidebands. Then the carrier without the sidebands acting as the local oscillator is mixed with the whole signal to generate the audio.

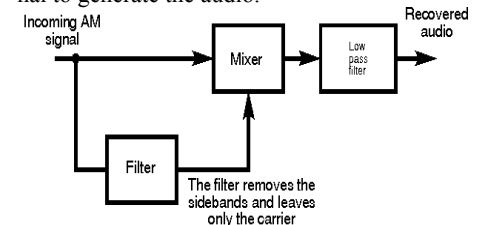


Figure 4 Synchronous demodulation using a filter to generate the local oscillator signal

Whilst this approach is feasible in theory it has the drawback that the incoming AM signal has to be on exactly the required frequency for the carrier to be able to pass through the narrow band filter. If the tuning is slightly incorrect then the carrier will not pass through the filter and the signal will not be demodulated.

Another way is to use a phase locked loop to lock onto the carrier as shown in Fig. 5. As before, part of the signal is passed directly into the mixer. However, the signal is also passed into the input of a phase locked loop to be used as the reference. This effectively forms a variable frequency filter where the VCO output from the loop is then used to drive the other input to the mixer. As the phase locked loop can be designed to lock over the range of the receiver passband, it does not matter about the exact tuning of the receiver. For this to operate satisfactorily the phase locked loop must have a narrow bandwidth; otherwise, interference may cause disturbance. This may mean that the loop takes

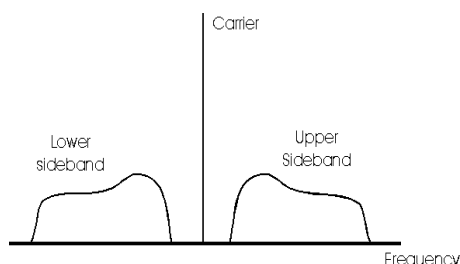


Figure 1 The spectrum of an amplitude modulated signal

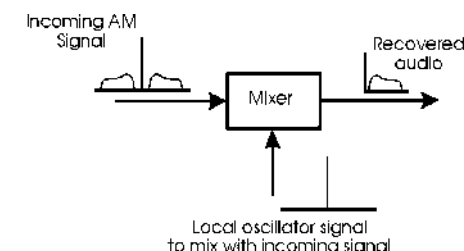


Figure 3 Synchronous demodulation

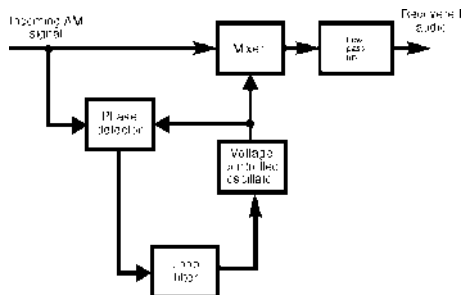


Figure 5 A synchronous detector using a phase locked loop

time to lock onto a signal.

The most commonly used method and the one that is the most elegant, is to pass some of the signal into a high gain limiting amplifier. The gain of the amplifier is such that it limits, and thereby removes, all the modulation. This leaves a signal consisting only of the carrier, and this can be used as the local oscillator signal in the mixer as shown in Fig. 6. This is most convenient, cheapest and certainly the most elegant method of producing synchronous demodulation. It does not require the station to be exactly on tune. Nor does it take time to lock, and it is very resilient to interference because the limiting amplifier removes most of the interference.

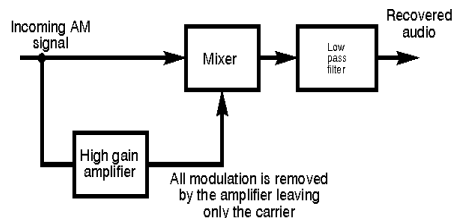


Figure 6 A synchronous detector using a high gain-limiting amplifier to extract the carrier

Advantages

A synchronous detector is more expensive to make than an ordinary diode detector, and in many applications the additional expense and complexity is not required. However, synchronous detectors have several advantages over ordinary diode detectors.

First, the level of distortion is less. This can be an advantage if a better level of quality is required, but for many communications receivers this might not be a problem. Instead, the main advantages lie in their ability to improve reception under adverse conditions, especially when selective fading occurs or when signal levels are low.

Under conditions when the carrier level is reduced by selective fading, the receiver is able to re-insert its own signal on the carrier frequency.

As a result, the effects of selective fading can be removed to greatly enhance reception.

The other advantage is an improved signal to noise ratio at low signal levels. As the demodulator is what is termed a coherent modulator, it only sees the components of noise that are in phase with the local oscillator. Consequently the noise level is reduced and the signal to noise ratio is improved.

Unfortunately, synchronous detectors are used in only a limited number of receivers because of their increased complexity. Where they are used, a noticeable improvement in receiver performance is seen. When choosing a receiver that will be used for shortwave broadcast reception, it is worth considering whether a synchronous detector is one of the facilities that is required.

More information about radio, amateur radio and electronics can be found at www.radio-electronics.com

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Radio Shack PRO-2067 Mobile Trunk-Tracking Scanner

The portable PRO-92 (see January 2000 *MT*) is built for Radio Shack by GRE and is capable of monitoring conventional, Motorola trunked (type I, II, and hybrid), Ericsson EDACS trunked, and LTR trunked systems. The PRO-92 was the first portable alternative to the Uniden-manufactured trunk trackers and hobbyists had high hopes for the new contender.

The PRO-2067 is a newer, mobile version of the PRO-92 and employs a different method of tracking Motorola trunked systems as well as a robust audio amplifier.

Both models tune the upper portion of the 10 meter ham band and the standard "scanner bands," as well as the 806 - 960 MHz range. They also function as a "weather alert radio," displaying SAME messages, but neither supports programming of location codes for local weather alerts.

❖ Mobile Package

The PRO-2067 is billed as a mobile scanner and includes a DC power cord and simple mobile mounting bracket. If you wish to use the PRO-2067 as a desktop unit, you'll need to purchase a 12 VDC 500 mA power supply and, ironically, we use a Uniden wall wart designed for the BC-9000XLT.

The PRO-2067 lacks rubber feet on the bottom of the cabinet to prevent table top scratches. We use an external speaker for better indoor listening because the underside speaker is situated for mobile application.

You can program the PRO-2067 with a computer (interface kit not supplied) or clone one PRO-2067 from another PRO-2067 or PRO-92 using the cable provided.

The keypad is not backlit, which is disappointing for a mobile model. The LCD display is well lit, but too small and busy to be read easily when the PRO-2067 is mounted below the dashboard.

❖ Memory

The PRO-2067 and PRO-92 use the same memory organization - 500 memory channels distributed among 10 banks, numbered 0 - 9.

Each memory channel is programmed with a frequency and what Radio Shack calls a "mode." The modes are AM, FM, Motorola Trunked, EDACS, LTR, PL, and DL (digital PL). You can mix combinations of conventional and LTR trunked frequencies within the same bank, but frequencies for each EDACS and Motorola trunked system must be programmed into their own separate bank.

PL and DPL are abbreviations derived from Motorola's trademarked terms Private Line (con-

tinuous tone coded squelch) and Digital Private Line (digital coded squelch). The PRO-2067 can detect and display a PL or DPL code on a signal almost instantaneously.

Each channel may be easily programmed with a 12 character label which is displayed along with the frequency. Each memory bank may have its own text label, but bank labels are not displayed while trunking or on channels assigned a PL or DPL code.

A built in attenuator may be enabled on a per-channel basis, though we didn't need to use it. Some PRO-2067 users find the attenuator helpful in preventing desensitization from strong VHF-high band signals when their radio is connected to an outdoor base station antenna.



❖ Scanning and Searching

As you might expect, memory banks can be sequentially scanned in any combination. We programmed 2 banks with conventional AM and FM frequencies, 3 banks with different Motorola trunked systems, 2 banks with an EDACS trunked system, and 2 banks with a local LTR trunked business system.

Our PRO-2067 scans all those banks in turn. There is no apparent delay when our PRO-2067 switches among conventional and trunked banks.

For trunking, one can program up to 100 talk group IDs in each of the 10 banks. The only way to program a talk group is to press the Trunk key while the PRO-2067 is listening to a signal on that trunk group. This inconvenience means you must wait around until someone actually uses the talk group, then press the Trunk key quickly, before the transmission ends.

You can lock out talk groups from the lists and conversations in these groups won't be scanned. Talk groups cannot be locked out while searching (i.e., scanning in the Open mode), a drawback when searching a trunked system in which one or more talk groups is dedicated to telemetry or other data.

While scanning trunked systems, you can instruct the PRO-2067 to hold on a particular talk group. It will scan all the trunked frequencies in the current bank, stopping only on conversations in that talk group.

The PRO-2067 provides a search with 10 pairs of frequency limits and you can search multiple ranges sequentially. The 10 ranges are preprogrammed, but their limits and text labels can be reprogrammed via the proper keystroke sequence. Up to 50 frequencies may be locked out in each bank. There is no auto store feature.

❖ Multi Line Display

Both the PRO-2067 and PRO-92 employ a 4 line, dot matrix liquid crystal display, and the PRO-2067 display is brightly lit at all times. One may adjust the contrast through a keypad sequence.

The display shows frequencies, channel, mode, and other indicators. When the PRO-2067 is stopped on a signal, the first line shows the channel number and other status information. For trunked channels, the remaining 3 lines show frequency, channel label, and talk group label.

❖ Subtleties

The PRO-2067 and PRO-92 are complex radios and some aspects of the way they work are not be obvious after a quick reading of the owner's manual. Owners of both models share operating hints at the www.pro-92.com web site.

You must program EDACS frequencies in the proper order, in a separate bank, starting with the second memory channel (01) in that bank. If you start programming them at the first channel (00), the radio won't track them properly.

Some features, e.g., the 2 second rescans delay, are implemented for conventional systems and don't function while the PRO-92 is monitoring trunked activity. Bank text labels are not displayed for trunked frequencies. The 4th line on the display shows talk group information instead.

As in the PRO-92, the PRO-2067's PL and DPL squelch are only effective while scanning in the Closed mode. We could find no way to configure either radio to sit on a single channel with PL or DPL, and prevent signals without the proper code from opening the squelch.

The Uniden Trunk Trackers support multiple talk group lists per bank vs. one list per bank in the GRE-made competitors. To obtain similar functionality in the PRO-2067, you could program the same trunked system frequencies into several channel banks, and program the corresponding talk group lists differently, e.g., one for police, another for fire, etc.

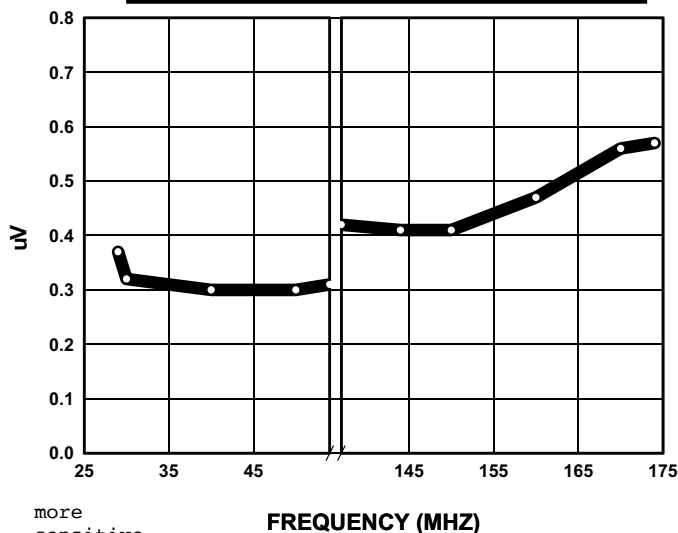
❖ Performance

Our PRO-2067 (s/n 00315) produces clean, crisp audio and the 1.9 watts is more than ad-

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PRO-2067 VHF NFM SENSITIVITY

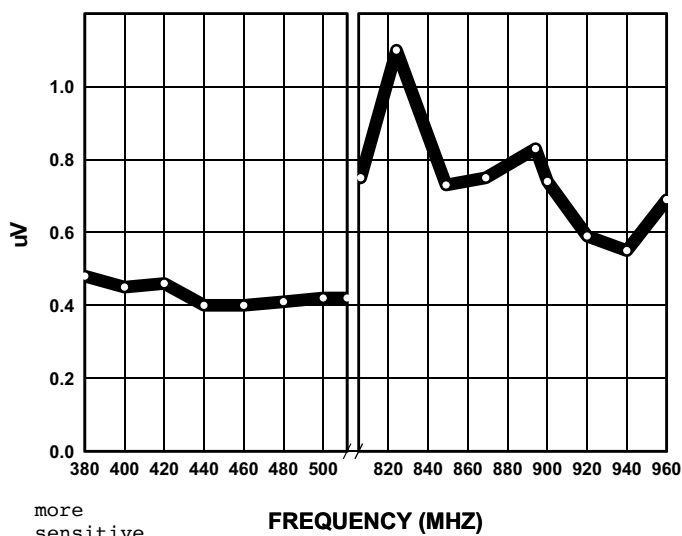
12 dB SINAD, 3 KHZ DEVIATION, Serial #003315



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PRO-2067 UHF NFM SENSITIVITY

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Measurements

Radio Shack PRO-2067 Scanner S/N 003315

List price: \$349.99
Tandy Corp.
Fort Worth, TX 76102

Frequency coverage (MHz):

29 - 54 (5, 10, 15, 20, 25, 30, 50, 100 kHz steps)
108 - 136.9875 (12.5, 25, 50, 100 kHz steps)
137 - 174 (5, 10, 15, 20, 25, 30, 50, 100 kHz steps)
380 - 512 (12.5, 25, 50, 100 kHz steps)
806 - 823.9375, 851 - 868.9875, 894 - 960 (12.5, 25, 50, 100 kHz steps)

FM modulation acceptance: 12 kHz

Intermediate Frequencies:

257.5, 21.4, and 0.455 MHz

Image rejection due to 1st IF:

69 dB at 155 MHz
69 dB at 224 MHz
66 dB at 460 MHz

Attenuator:

20 dB @ 40 MHz
20 dB @ 155 MHz
15 dB @ 460 MHz
11 dB @ 860 MHz

Audio output power, measured at ext. speaker jack:

1.9 W into 8 ohms @ 10% distortion

Squelch tail near threshold:

(1 uV @ 155 MHz): 4 ms.

Practical memory scan speed:

23 channels/sec.

equate when using an external speaker. It is sensitive and has excellent image rejection.

The PRO-92 and PRO-2067 differ in the way they track Motorola trunked systems. The original PRO-92 monitors the subaudible data transmitted "under" voice traffic. It sometimes displays the wrong talk group ID as a consequence, a behavior which has come to be known as "wobble." In contrast, the PRO-2067 implementation uses data transmitted on the control channel, the method used by Uniden.

Our PRO-2067 doesn't have an ID wobble problem, but has a different bug. It sometimes fails to display a talk group label while paused on a transmission in a Motorola trunked system in Open mode. The proper label appears as soon as we press the Manual key.

The PRO-92 we reviewed last January works well tracking the small to medium size trunked systems in our locale, but some PRO-92 users in other areas report problems tracking larger and busier systems (March 2000 MT). While the PRO-92 tracks our local systems well, the PRO-2067 tracks them better. It follows conversations when held on a chosen talk group and misses

fewer call backs in the EDACS systems. The 23 channel/sec. scan speed is acceptable, though slower than Uniden models. We don't know how well the PRO-2067 performs monitoring large, heavily loaded, analog trunked systems because there aren't any nearby.

❖ Overall

The PRO-2067 packs a lot of capability into a small package and we are impressed with its performance. The instantaneous PL/DPL code display is fantastic, though the PL and DPL squelch should be designed to function while in manual mode. The alpha channel labeling – a "must have" for scanners with several hundred channels – is easily programmed.

Listeners who concentrate more heavily on trunked systems would appreciate the ability to lock out talk groups while searching and may find the PRO-2067's monolithic talk group lists too restrictive.

The Pro-2067 is available from Grove Enterprises for \$339.95 (800-438-8155 to order)

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Clear Speech In-line Device

A cutting-edge concept just a few years ago, noise-cancelling technology is finding applications far beyond the now familiar earphones. NCT (Noise Cancelling Technologies) Group, Inc., has been providing noise cancelling speakers, headsets and microphones to hobbyists and communications systems through its ClearSpeech line. NCT has recently announced a new product, ClearSpeech™-Base, which plugs in line with your existing system components to work its magic.

ClearSpeech incorporates NCT's patented algorithm to clean background noise from incoming speech signals for the utmost in intelligibility, removing up to 95% of constant noise from a signal containing noise and speech. The algorithm is adaptive—as background noise changes, it continues to cancel the noise for consistent performance. ClearSpeech-Base claims to be highly effective at reducing atmospheric static, electrical noise from power lines, computer hash, automotive ignition noise, and heterodynes.

ClearSpeech-Base or the ClearSpeech-Speaker are available direct from the manufacturer, Am-Com Inc., for \$149.95 each. For more information or to order either product, call Am-Com Inc. at 888-803-5823.

For some on-line demonstrations of what noise-cancelling technology can do, refer to NCT's website at <http://www.nct-active.com>. You can also order ClearSpeech and check out other products online, such as a software program which can clean up previously recorded wave files.

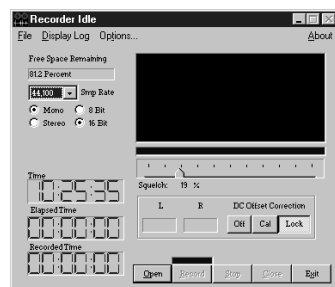
Scanner Recorder

Speaking of wave files, Bill Crocker called our attention to a software program called Scanner Recorder which uses your PC's sound card to record audio from almost any input device. A couple of special features make it a particularly useful tool.

First off, Scanner Recorder only records when the incoming signal is above a user specified threshold, which allows the recorder to pause

while nothing is being received. The automatic pause could be used for recording the date, time and other information every time the squelch opens. It also allows you to catch rarely heard conversations on channels that rarely have activity. Scanner Recorder can also compress as it records, allowing you to record broadcast radio or TV in a large wave file for later playback.

Scanner Recorder provides a



switched recorder that listens to the sound coming into the audio card and if the sound is above the minimum threshold, the recorder operates. If the sound level falls below the threshold, the recorder pauses. This prevents the very beginning of the audio from being clipped off as in mechanical vox controlled recorders. When sound is played back, there is no noticeable "click"—a great feature for dictation, too.

System requirements are 486 PC or faster, 4 MB RAM, Windows 95, 98, or NT; and an 8 or 16 bit Windows compatible sound card with record capability. As to price and availability, Scanner Recorder is Free, so download it from <http://www.davee.com/scanrec.html> and enjoy it!

Antennas from LF Engineering

LF Engineering designs and manufactures products for some specialty hobby interests who otherwise would have to build their own, catering especially to low frequencies and below with antennas, preamps, and converters! Their flyer of products can be had by writing to LF Engineering Co, 17 Jeffry Road, East Haven, CO 06523, call 860-526-4759, email to sales@lfengineering.com, or visit www.lfengineering.com.

New in this flyer is the L-111 LF Converter and Active Antenna System. Used together with a receiver that can tune 4.0-4.5 MHz, the active antenna and converter cover the LF spectrum from around 3 kHz to 530 kHz. Find out what your short-wave receiver has been missing! For \$159 (ppd), finally be able to tune into those signals Kevin Carey keeps talking about in the *Below 500 kHz* column.

The H-800 Skymatch antenna is another new offering from LF Engineering. This two-foot antenna is anything but narrow in its application—it receives signals from 10 kHz through 50 MHz and performs like a 100 foot antenna. It operates either from AC or batteries. This active antenna sells for \$129 (includes shipping in U.S.) directly from LF Engineering or Grove (800-438-8155).

Hamcall CD-ROM

For decades, the Buckmaster databases in print, and now CD-ROM, have been the mainstay of amateur radio references. HamCall for Windows or DOS is an example—probably the most noteworthy and widely in use.

Containing pertinent data on more than 1-1/2 million U.S. hams, the self-installing disc works on Windows 3.x/95/98/2000 and DOS. The installation procedure is menu driven, taking a minute or two to click through.

The working screen is a cornucopia of information; after entering the call sign, the page shows name, address, grid square locator, license class, former licenses, issuance and expiration dates, hobbies, antennas, preferred modes and bands, and any other information which had been volunteered to Buckmaster on his registration website.

There is also a nice search capability, but it's a little touchier. If you don't know exactly how a record will



be listed, you will need to try several combinations, avoiding nicknames, middle initials (even though they're present in the database), abbreviations, etc. After several tries, you'll probably come up with a list from which you can choose the correct individual.

The flexible program offers an editing and a print facility as well as look-up features. This is a handy database for \$50 plus \$5 shipping in the U.S. There is also a monthly update subscription program. For more information, including ordering, visit the Buckmaster website at www.buck.com/hammain.html.

Old Time Radio CDs

We normally associate Computer Aided Technologies with their versatile selection of radio-related software, like their popular "ScanCat" series. But recently, a new line of "software" has emerged—digital recordings of old time radio broadcasts.

Nostalgic recordings from radio's golden age include all the perennial favorites: Amos 'n Andy, Fibber McGee and Molly, Jack Benny, Burns and Allen, Bob Hope, Sam Spade, Dragnet, Inner Sanctum, and more.

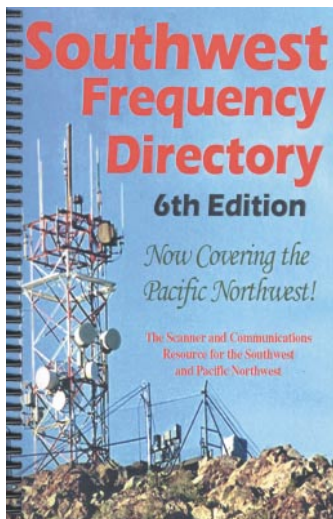
Selected from over 15 GB of MP3 and Real Audio files, each CD has over 60 programs, with disks categorized by comedy, detective, drama, mystery, sci-fi, super heroes, western, and more. Each CD includes RealPlayer and WinAmp shareware.

CDs are \$29.95 each plus \$5 shipping per order. For a complete listing write to Computer Aided Technologies, PO Box 18285, Shreveport, LA 71138.

Southwest Directory

Scanner buffs in the Arizona, Utah, Oregon, Washington, and Nevada should be pleased with the *Southwest Frequency Directory* by Dan Rollman which now also includes a traveler's information section for major U.S. destinations like LA, NY, Boston, Miami, and others.

The handy, spiral-bound handbook includes frequencies, channel numbers, trunking talk groups, radio codes, unit designators, fire station



resources, and PL tones. Services include public safety, aircraft, recreation, government, and schools.

A cogent "Other Frequencies" appendix references nationwide frequencies like itinerant, FRS, medical paging, NOAA/NWS, wireless mikes, expanded cordless phones, GMRS, CAP, air shows, auto racing, and maritime.

The *Southwest Frequency Directory-6* is available for \$29.99. For more more information including ordering, visit their website at www.scannerstuff.com.

Cybiko Portable Entertainment

Is it a pager? Is it a personal data assistant? Is it a personal computer? A new game player? Well, yes and no; it's all of these and more. The

Cybiko device is both an entertainment and a communications system. It combines instant messaging, interactive gaming, email and personal information manager capabilities in an all-in-one device geared to the youth market.

"The Internet and kids themselves are changing the rules," says Donald Wisniewski, President, Cybiko, Inc.

"They want true interactivity, new ways to communicate, Internet access and they want to be mobile. Our new Cybiko platform delivers on all counts with wireless chat for up to 99 people, true interactive



gaming through walls and ceilings and the ability to take their email with them all packed in a portable, on-the-go device. And, with hundreds of free game and application downloads from www.cybiko.com, coupled with our commitment to provide a brand new game or application each day, this becomes one awesome product."

The company promises hundreds of games will be available by mid year. Many of the games and features are educational or creative, such as Spanish and German translators, logic games, graphics editor, and music composer. Know what the game of the day was when I checked in? Morse code - "a really cool system of sending messages..."!

Anyone who wishes may obtain the sets of information and resources necessary to develop new games and may submit them for inclusion on the gaming download page.

Cybiko can alert the user when a friend is within range, or allow users to browse the virtual network to connect with everyone in the area. Range is not that great, however - only 150 to 300 feet. (The new way to pass messages in class?)

Available in four translucent colors, Cybiko has a full QWERTY keyboard with a stylus stored in the

top of the unit to compose messages, LCD display, 1.25 MB memory (expandable to 8 MB), a high frequency transmitter (Robert Wyman checked the FCC site and found the Cybiko to be classified as a DXT Part-15 Low Power Transceiver operating between 903.2 and 926.8 MHz).

The unit measures 4.8 x 2.8-inches and weighs under four ounces, making it light, thin and small enough to carry in a book bag, purse or shirt pocket. It comes complete with an Internet RS232 connection cable to link to any PC, two rechargeable high capacity metal nickel hydride batteries and wall recharger.

Cybiko sells for \$129.00 from the company's online site, and is also available from a number of retailers, including FAO Schwarz and Amazon.com. Check their website for sources at www.cybiko.com or you can call 1-630-540-1961.

Quebec Database

Long-time Quebec scanner aficionado Gilles Thibodeau has released his latest French language, province-wide frequency database on 3-1/2" floppy disk. Containing 12,600 line entries for police, fire, ambulance, business, local and federal government (including RCMP), files can be exported by any DBASE software program.

For more information, write to Gilles Thibodeau at PO Box 193, Lac-Mégantic, Quebec, Canada G6B 2S6.

Mr. Scanner FCC Database CD-ROM

If you're looking for a bare-bones FCC database for scanning (25-1000 MHz) at a rock-bottom price, take a close look at the Mr. Scanner. Consisting of two CD-ROMs and covering the entire 50 states and Canada, this package works on Windows 3.1, 95, and 98 as well as DOS 3.3 and higher.

Fields include frequency, city, county, call sign, and service code, and searches may be printed or exported in ASCII or DBASE. Services included public safety, business and industrial, experimental, paging, cellular, and many more. \$19.99 plus \$6 shipping from Computer Media Concepts, 527 North Polk St., Pineville, NC 28134; ph. (704) 889-0172.

Satellit 800 RDI White Paper

Although the much-anticipated Grundig Satellit 800 has been in production for several months now, they have not been in evidence on the shelves for the back-log of advance orders. For you skeptics who wanted to wait until the verdict was in, wait no longer! The Radio Database International White Paper evaluation of the Grundig Satellit 800 is now available from the publishers of *Passport to World Band Radio*.

The review panel for the Satellit 800 (Lawrence Magne, Robert Sherwood, George Zeller, and Avery Comarow) examined three separate units to ensure accuracy. Some significant differences between units were found, though it was stated this was not unusual for early production models. The 18-page report includes a general description of the radio and its background, an assessment of how the S-800 handles, how it performs, and results of the laboratory tests.

If you want to know why the panel concludes, "At under \$500, the Grundig Satellit 800 is nothing less than a benchmark receiver - send in your \$6.95 (US and Canada; \$9.95 elsewhere) for the Satellit 800 White Paper to International Broadcasting Services, Box 300, Penn's Park, PA 18943, visit www.passband.com, or call 215-598-9018 (automated order line) or 215-598-2794 (fax).

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mteditor@grove-ent.com.

Wellbrook Antenna Splitter AS 1030

By Jaques d'Avignon

The most important piece of equipment needed when you organize a DXpedition is one or more antenna amplifier/splitters. It is a vital piece of equipment if you want everyone using the same antennas without potential degradation of the signal. Food and drink are also important, but secondary to this!

Up until early this year, our DXpedition group was relying on a massive, borrowed piece of equipment that could properly service 20 receivers, but required a warm up time before stabilizing, since it still used vacuum tubes! The sheer weight made hauling it a weight-losing exercise. It had been built for the Navy and the quality of the output signals was also equal to its weight: high. The isolation between outputs was also very high.

We needed something smaller, preferably solid state, that could be carried around easily to remote sites if required. It was not necessary to have 20 output ports, as our normal group of DXers consists of 4 to a maximum of 6 individuals. (I can be so specific on the numbers simply because that's the number of beds available at our location!)

Over the years, I had heard many disparaging comments about various solid state antenna amplifier/splitter, such as: "The intermodulation is horrific and the images will kill all the good signals the you will be trying to hear and share." And on and on ... From all I had heard, intermodulation was the biggest problem; never did I hear any mention of interaction between the various receivers as being a problem due to lack of isolation between the output ports.

After looking at the specs for the untuned loop made by Wellbrook Communications (see the review April 2000 *MT*), I had an exchange of e-mails with the sales department of this company and was advised that an antenna amplifier/splitter of a new design could be made available in prototype form. The first unit built from this new design had already been shipped to a Finnish based DX club. Wellbrook sent me the specifications and after carefully studying them, I

decide to take the plunge and obtain one unit even if it was still in the prototype mode.

This AS 1030 unit is designed to cover the frequencies between: 100 kHz to 10 MHz. Specifically it is optimized to cover the LF (Low Frequency) and MW (broadcast band) frequencies. An amplification of 8dB is constant from 100 kHz to 3 MHz. The amplification then decreases between 3 and 10 MHz to reach a nominal value of 0dB at 10 MHz. Above this frequency, this unit simply splits the signals without any amplification or absorption, but still provides isolation between the receivers connected

it was apparent that they had been most successful from this site. This would explain why this particular antenna splitter had been optimized for that part of the spectrum! Somewhere on their home page I found a photograph in which I could barely distinguish in the background the same type of splitter that I acquired!

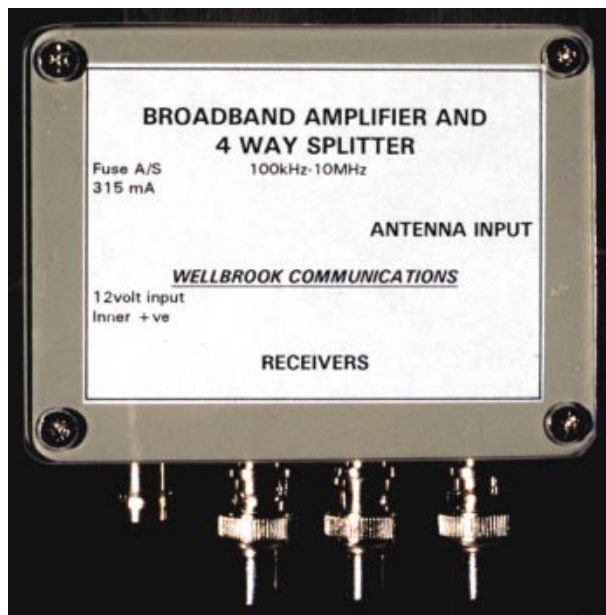
This was an interesting development, but all this information left me with one unresolved question. This splitter was optimized for the LF and MW part of the spectrum, but it was being used in Northern Finland – an area that with very little transmitter activity; how would it perform in a less remote and more RF active area where the signals from many broadcast stations on the MW band will be present?

We put the splitter to the test

During a DXpedition in January 2000, we had the opportunity of trying this new splitter connected to a 1000 ft antenna. The results were excellent, and at no time did any intermodulation appear to cause us any problems. Another splitter that had been purchased by a member of our group was connected to a 500 ft antenna and had to be removed from service because of the intermodulation that plagued it from 2.3 MHz to over 4 MHz and on numerous other large segments of the HF band.

Wellbrook Communications claims that the intercept points for intermodulation at 2nd and 3rd order are respectively +72dBm and +40dBm. Not having the necessary equipment to verify these values, I can only say that we did not encounter any intermodulation problems of any sort in the HF band during our DXpeditions. Also, the isolation between each of the four outputs is published as being 25dB, and I have no reason to dispute this figure.

The input and output ports have a 50 ohm impedance, and it is recommended that the unused output ports be terminated with a resistor. This is what you see in the figure 1; I had to keep one port open for my own use! The antenna input port was shy and does not really show up in the photograph, but believe me it



to it. So, no matter what frequency your receiver is tuned to, you get all the benefits of the splitter unit without having to bypass it at any time; nor are you disturbed by the local oscillator of the other receivers connected to this splitter.

After I was told that the first unit had been shipped to a Finnish DX club, I did some net surfing and found the home page of a Finnish club that operates a DX cabin north of the Arctic circle: www.makelainen.com/dx/dxpedit.htm. They seem to specialize in broadcast band (MW) DXing. By perusing their logs,

Diamond RH77CA vs. Condor Scanner Antenna

By Bob Grove



For years, the Austin Condor rubber duckie antenna has been the replacement whip of choice for hand-held scanners. Recently, a new competitor has emerged on the block: The Diamond RH77CA.

The 12" long, 1/2" thick Condor is advertised as a three-band (150-174, 450-512, 806-896 MHz) flex antenna capable of transmitting up to five watts. The 14", slim (1/8") Diamond is advertised to cover 144-148 and

420-450 MHz for transmitting up to ten watts, and 120/150/300/450/800/900 MHz for receiving. So how do these two rubber wonders really compare?

We alternated between two different hand-held scanners, using both antennas as well as the scanners' original duckies. Entering a variety of weak signals throughout the scanners' tuning ranges, we exchanged antennas, noting the results.

And what were those results? The antennas were virtually identical in performance! Both were better than the original factory antennas, often by a considerable margin.

The Austin Condor is available for \$29.95; the Diamond RH77CA retails for \$24.95. Both are available from a variety of MT advertisers.

exists. The label shown on my unit is a label affixed to the prototype that didn't show the newly assigned part number.

This splitter/amplifier can be connected to a passive or active antenna – perhaps not particularly useful during a DXpedition, but it could be a valuable asset back on the home front if you are using an active loop, a wire antenna and/or an active dipole antenna. We did use this unit during the January DXpedition to distribute to all the listeners the signal from the ALA 1530 active loop antenna also manufactured by Wellbrook Communications.

The specification sheet states that this amplifier/splitter requires a "regulated" 12V power supply. This statement would automatically prevent me from using a small wall plug power supply. These wall plug power supplies are not regulated and even if they are labeled as 12V, they can deliver as high as 18 to 20V with no load. It is difficult to really know what the voltage will be once a load is connected. This high voltage, if it does not drop significantly when a load is connected to the output, could be highly detrimental to (i.e., will fry) the electronics of this amplifier. The power consumption for this amplifier/splitter unit is 100 mA, so a lead acid battery will last a long weekend without any difficulty during a DXpedition.

By installing a voltage regulator circuit in

the amplifier box, the requirement for a regulated source of power could possibly have been avoided. Presently the safest power source to supply this amplifier/splitter is to use a 12V regulated power. During the January DXpedition when this splitter was first tested, a "Battery in a Bucket . . . the safe way" (MT January 1999) was used and the battery was recharged between listening sessions. Because of the high drain, regular dry cells cannot be used.

You can check the Web site www.wellbrook.uk.com for more information on this product and a few more of great interest to the North American SWL. You might see a notation in the literature or on-line that says that the Wellbrook Communications products are not available in North America, but this is no longer the case. This splitter/amplifier can be purchased directly from:

Wellbrook Communications
Wellbrook House
Brookside Road, Bransgore
Christchurch, BH23 8NA
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EDITORIAL STAFF

Correspondence to columnists may be mailed c/o *Monitoring Times*; any request for a reply should include an SASE.

| | | |
|-----------------------------|-----------------------------|--|
| Frequency Manager | Gayle Van Horn | gayle@webworkz.com |
| Frequency Monitors | Mark J. Fine | fineware@erols.com |
| | Dan Roberts | outfarpress@saber.net |
| Program Manager | John Figliozi, KC2BPU | jfiglio1@nycap.rr.com |
| American Bandscan | Doug Smith, W9WI | w9wi@bellsouth.net |
| Antenna Topics | W. Clem Small, KR6A | clemstal@bitterroot.net |
| Ask Bob | Bob Grove | bgrove@grove-ent.com |
| Beginner's Corner | T.J. Arey, N2EI | tjarey@home.com |
| Below 500 kHz | Kevin Carey, WB2QMY | lowband@gateway.net |
| Bright Ideas | Gary Webbenhurst | ab7ni@arrl.net |
| Closing Comments | Bob Grove | bgrove@grove-ent.com |
| Communications | Rachel Baughn | mteditor@grove-ent.com |
| Computers and Radio | John Catalano | j_catalano@conknet.com |
| Digital Digest | Stan Scalsky | sscalask@mail.ameritel.net |
| | Mike Chace | mike.chace@mindspring.com |
| Easy Access Radio | Jock Elliott KB2GOM | lightkeeper@sprintmail.com |
| Federal File | Larry Van Horn, N5FPW | larry@grove-ent.com |
| Letters to the Editor | Rachel Baughn | mteditor@grove-ent.com |
| Milcom | Larry Van Horn, N5FPW | larry@grove-ent.com |
| On the Ham Bands | Ike Kerschner, N3IK | N3IK@hotmail.com |
| Outer Limits | George Zeller | georgez@nacs.net |
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| Programming Spotlight | John Figliozi, KC2BPU | jfiglio1@nycap.rr.com |
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By Bob Grove,
Publisher

The Internet

Learn to Like It; It's Here to Stay

While giant computers have been around for four decades, it wasn't until the early '80s that affordable tabletop systems began to penetrate small businesses. The Radio Shack TRS-80, as primitive as we may now view it in retrospect with its painfully slow processing speeds and laborious Basic language, was a prime mover in changing information processing and records keeping forever.

The early machines were a terrible affront to radio listeners; it seemed that even while still in the box they caused interference! When they were situated anywhere near a radio, their time-base oscillators ("clocks") and CRT sweep circuitry unleashed a barrage of objectionable electrical radiation that made shortwave listening unbearable. And as clock speeds increased (Read: frequencies increased), VHF/UHF scanner listeners bore the brunt of the assault as well.

Fortunately, nudged by the FCC, the industry largely cleaned up its act, and the introduction of compact, low-current, laptop computers reduced the electrical hash even more. While I once wrote in *MT* that I would never have a computer in my radio room, I'm typing this editorial within three feet of my monitoring post! I have no evidence of radio interference on any frequency range.

While we probably all agree now that computers are a good thing, we don't all share the same agreement about the Internet. It seems that this magical cornucopia of information has warts; it affords unconscionable exploiters a limitless means of committing fraud, vendors of pornographic materials means to purvey their prurient product uninvited, entrepreneurs of all kinds to inform you about their wares whether or not you want them ("spamming"), and low-integrity individuals to say anything about any-

one with apparent impunity ("flaming").

But this may be the price we must pay, at least during these early phases, for the most incredible informational resource and communications system the world has ever known. In our hobby alone, domestic and international broadcasters abound, proffering continuous music, talk, news, and other global entertainment and edification without interference, distortion, or fading.

Individuals, clubs, and groups offer informational exchanges on every topic you can imagine, and some you would rather not. Want to build your own receiver? Transmitter? Nuclear device? They're all here and more.

Is eventual government regulation inevitable? Probably. Tapping the wealth of the Internet as a taxable entity is irresistible, and among the most influential lobbies in Washington are the industries most affected by such free trade, including telecommunications, pharmaceuticals, and motor vehicles. And there are the ultra-conservative zealots who insist on protecting us from ourselves on whatever issue or personal agenda piques their moral outrage at the moment.

In the meantime, however, we can reap the benefits of this boundless supply of information. Search engines, the heart of the Internet, take the work out of hunting. Type in a topic and, within seconds, a list of Web sites appears like packages under a Christmas tree, awaiting opening by our eager opening fingers!

Arguably, the best search engine so far is Google, with their claim of being able to search the equivalent of a billion documents – that's a stack of pages 30 miles high – in half a second! Let's give it a try right now: I'm going to type "phlogiston" into the search line.

Wow – 3,450 separate resources in 0.06 seconds; not bad! And they are arranged in the most

useful order, with the best hits first, and the least useful last. If you want to know what phlogiston is, you'll have to type it in yourself!

And how about shopping? Super sites like ebay and amazon.com take the work out of phoning, hunting through magazines and newspapers, and driving all over town to find the right products at the right prices. Whether you work the auction sites or the search engines, you can find anything on the Internet. And let's not forget e-mail with its instant interconnect with family, friends, business associates, vendors, buyers, educators, and just plain chatty folks!

But can you trust everything you see and everyone you meet? Absolutely not. Misinformation and fraud are rampant on the Net. Remember, at this time in its evolution, anyone can say anything on this medium; this is a place where discernment and wisdom are prerequisites.

So is the Internet really nothing more than a huge mall? A massive library? A worldwide telegram system? No, it's much more. It is a true revolution in the way we shop, interact, educate, and communicate. It represents, for the first time in history, the prospect of making the world a smaller place. It is a unifying medium by which individuals formerly separated by thousands of miles can become neighbors. It is a unique opportunity for barriers to come down – "hands across the sea" – if you will, as we exchange ideas, fears, wants, and hopes.

But we have to take advantage of this opportunity. Use this precious medium, familiarize yourself with all its crevasses, guard it against usury, and defend it from becoming a politically manipulated tool of big business and partisan government. There will never be another Internet quite like the tool available to us today.



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